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Clean Milk for Cities

THE articles, elsewhere reviewed, in the June *McClure's* and *Craftsman* on efforts to safeguard the milk supply of cities are seasonable, since the summer months are those of greatest danger. To the descriptions, data and conclusions of the articles it may be well to add a few words of comment. First, it should be said that Dr. Goler, the Rochester health officer who has achieved such extraordinary success, would be the first to protest that the methods he adopted will not be everywhere applicable. He does not claim that they would solve the problem in

New York, where 1,600,000 quarts of milk are daily drawn from over 30,000 dairies, some of them 400 miles away, against Rochester's 75,000 quarts per day, from 700 farms, of which none is distant more than 50 or 60 miles. In Rochester there are 225 retailers; in New York about 12,000. Yet Rochester is a city of some 200,000 population, and it would seem that what can be done there should be possible in smaller cities, so that the lesson is applicable to most of our municipalities. Further, not all the decrease in infant mortality is due to the better milk. Some decrease is to be found in most cities, thanks to the general progress in hygiene and sanitation. This neither article makes clear enough. Finally, Rochester seems likely within a short time to be brought face to face with a new and very difficult problem in its milk campaign. A number of the dairy-men are making an effort, almost certain to succeed, to get their product into less scrupulous and much richer New York. When this is done Rochester will have to get milk further afield. But the fact remains that the Rochester Health Bureau has done a very remarkable work and one that is full of suggestion for other cities. It is already a radiating educational influence, where queries are generously answered. For accomplishing so much Dr. Goler, who is ever modest, would want credit given also to his assistants, Dr. Joseph Roby, whose zeal has been unfailing; William O. Marshall, chief milk inspector, and Frederick R. Eilinger, chemist.

Reducing Public Service Rates by Law

THE Master in Chancery has decided that 80 cents for gas in New York City would not give the company a fair return upon its legitimate capitalization, and that therefore the law fixing this rate cannot stand, and although this may be reversed by the higher courts it calls attention to the fact that Legislatures cannot enforce inequitable rates. Governor Hughes emphasized the same idea in vetoing the New York 2-cent fare bill on the ground that this rate had been named arbitrarily by the Legislature without investigation as to its equity, and it is probable that similar laws in other States may be overthrown on the same ground. These call attention to a tendency of the people to misuse their recently realized power to control public service rates, of which there are a large number of instances, and which are being added to weekly. Whatever may have been the delinquencies or worse of such corporations in the past, these cannot be considered to justify injustice to them in the present or future. Any corporation is entitled to a fair return on all its legitimate investments over and above all expenses when these are carefully and economically administered. There are some

corporations which are undoubtedly overcharging the public; but there are more whose stock has never paid any dividends whatever; and only an unfortunate aggravation of the present strained relations existing between the people and the public service corporations can result from the expectation of the former that they can, through legislative action, obtain a universal reduction in the charges made by such corporations.

PAVING CONTRACTS AND PAYMENTS

THE American Academy of Political and Social Science has collected and published, in the May number of their annals, a symposium on municipal paving in seventeen of the largest cities of the country, the articles being contributed by engineers, officials of public service boards, statisticians and others presumably competent to present the facts concerning their respective cities. We have endeavored to extract from this certain information which we think will probably be of interest to our readers.

The lengths of time for which paving contracts must be advertised are prescribed in most of these cities and are as follows: New York, 10 days; Chicago, not less than 10 nor more than 14; Philadelphia, 10 days; St. Louis, 10 days; Cleveland, not less than 2 nor more than 4 consecutive weeks; Buffalo, 2 weeks; Cincinnati, 30 days; Washington, 1 week; Louisville, 2 weeks; Detroit, no time specified.

It is the common practice to open all bids in public and the writers of these articles state that this is required in New York, Chicago, Washington and Duluth; and that in Boston all proposals must, after the awarding of the contract, be open to inspection by any citizen. In New York the contract must be let to the lowest bidder, which may be done by the Borough President, or it may be let to another by a three-fourths vote of the Board of Estimate and Apportionment. In Chicago it is not required that contracts be let to the lowest bidder, but if the majority of property owners believe the prices selected to be excessive they may undertake the work themselves and receive therefor ten per cent. less than such prices. In Philadelphia the contract must be let to the lowest responsible bidder. In Cleveland to the lowest and best bidder, as determined by the judgment of the Board of Public Service. In Buffalo the Commission of Public Works reports the bids to the common council, certifying to the one which is lowest. In Cincinnati and Indianapolis any or all bids may be rejected. In Washington, Hartford and Des Moines contracts are let to the lowest responsible bidder. In Louisville to the lowest and best bidder, subject to the approval of council. In Minneapolis separate contracts are awarded for material and for labor, the decision resting with the city council. In Duluth contract is given to the lowest responsible bidder on the given material, which material is nominally designated by council, but in practice the property owners make such decision.

In constructing an original pavement the work is initiated in New York by a resolution of the Board of Esti-

mate and Apportionment; in Chicago by the Board of Local Improvements, after a public hearing; St. Louis by the Board of Public Improvements; in Baltimore, the kind of paving for a number of given streets has been fixed by ordinance, council orders the work and the Board of Estimate appropriates the money; in Cincinnati initiation lies with the Board of Public Service; in Detroit with the council; in Louisville with the Board of Public Works; in Indianapolis the same; in Des Moines by petition of the owners of a majority of the frontage affected and a majority vote of the council, or a three-fourths vote of the council without such petition; in Duluth by petition of twenty-five per cent. of the property owners, owning at least twenty-five per cent. of the property, together with a majority vote of council.

Original paving is paid for in New York by assessment on the property; in Chicago mostly by the property, but six per cent. to twenty-five per cent. from the general funds for "public benefits"; in Philadelphia, Cleveland, Detroit, Minneapolis and Indianapolis by abutting property, except street intersections; in St. Louis one-fourth by abutting property and three-fourths by the area of the district benefited; in Boston part of the cost is assessed on adjoining lands and the balance as a general expense; in Cincinnati by abutting property, except two per cent. and street intersections; in Louisville by abutting property; in Des Moines by abutting property in proportion to the benefits (limited to twenty-five per cent. of the value of the property); in Duluth part by abutting property, part by lots on intersecting avenues.

In New York repaving initiates with the Borough President; in Chicago the same rule applies as to new work. No information was given concerning the other cities. The payments for repaving are made in New York and Hartford by the city at large; in Chicago as for original paving; in Cleveland and Cincinnati one-half by the city at large; in Detroit from a general road fund.

Street railways in New York, Washington and Hartford pave between rails and for 2 ft. outside; in Chicago between the rails; in St. Louis between the rails and 1 ft. outside; in Cleveland between the rails and 18 in. outside; in Detroit between the rails in some cases; in Minneapolis between the rails; in Indianapolis between rails and 18 in. outside; in Des Moines 7 ft. for single track and 14 ft. for double; in Duluth the extra cost made necessary by its rails, amounting to about 50 cents per square yard for the paving between and 1 ft. outside of the rails.

In Chicago payments made by property owners can be divided into 5 or 10 annual installments; in St. Louis 6 annual payments may be made; in Boston 10; in Cleveland 10 semi-annual; in Cincinnati 5 or 10 annual; in Detroit 4 annual; in Washington 3 annual; in Minneapolis 5 annual; in Indianapolis 10 annual; in Des Moines 7 annual.

In two cities, Philadelphia and St. Louis, payments to contractors are made not in cash, but by assessment bills against the property titles, which the contractor must collect from the owners.

STREET CLEANING ACCOUNTS

Description by Superintendent J. T. Fetherston of System Employed by Bureau of Street Cleaning, Borough of Richmond—Great Reduction in Cost of Work Effected Thereby

WE have frequently expressed our belief that an intelligent and careful keeping of the accounts of municipal departments can be made to result in considerable increase in efficiency of work done, also in the economy of the same; but it is not often that we are able to strengthen our claim by such convincing evidence as that which is offered by the Bureau of Street Cleaning of the Borough of Richmond (Staten Island) of Greater New York. This department has been in charge of Mr. J. T. Fetherston as Superintendent. In a paper read recently before the Municipal Engineers of the City of New York, he expressed the following opinions concerning such work as is covered by his department. "Individual responsibility for work assigned is necessary. Employees should be paid for work performed instead of hours of labor. Several rates of pay for one grade of work will prove desirable. Efficiency records of employees individually, of sections under foremen and of districts under inspectors or superintendents will create a healthy rivalry and conduce to better work. The cost keeping system will more than pay for the clerical work involved. Vacations for all yearly employees from laborers upward, with extra time off for men of high standing, will prove beneficial. Regulations governing appointment, punishment by deducting pay for violations of the rules of the service will be less effective than loss of vacations."

Table number 1 shows the amount of street sweeping done during each month from 1900 to 1906 inclusive. (The significance of the remark "no work after November 6, 1901," lies in the fact that the next day was election day.) Table number 3 shows the cost per mile of street sweeping for the same years, and it is seen that between the years 1902 and 1906 the cost has been reduced from an average of approximately \$20 to about \$4 per mile per month; and when it is considered that there was made in 1904 an increase of from 12 per cent. to 16 per cent. in the wages of sweepers and foremen, this reduction would appear to be marvelous, assuming that the character of the work performed was equally as high. As a matter of fact we believe that the cleaning of the streets has been performed more thoroughly during the past two years than ever before; and *practically the entire credit for the four-fifths reduction in cost, and also much of that for the increase in efficiency, is attributed by the superintendent to the effect of the cost-keeping system and efficiency record of employees, which have been developed to a high degree of thoroughness.* An indication of the increase in efficiency during the past three years is given by the record of complaints made concerning removal of refuse from the houses (which is a part of the duty of this department). The complaints in 1904 were 131, in 1905, 81 and in 1906, 61; upon investigation, the punishments found necessary numbered 10 in 1904, 3 in 1905 and 4 in 1906. In 1904 the service was performed by hired carts, in the two following years by city carts. The hired cart drivers gave unsatisfactory

Table No. 1.
Bureau of Street Cleaning Borough of Richmond
Comparison by months of No. of miles of Streets swept from 1900 to 1906

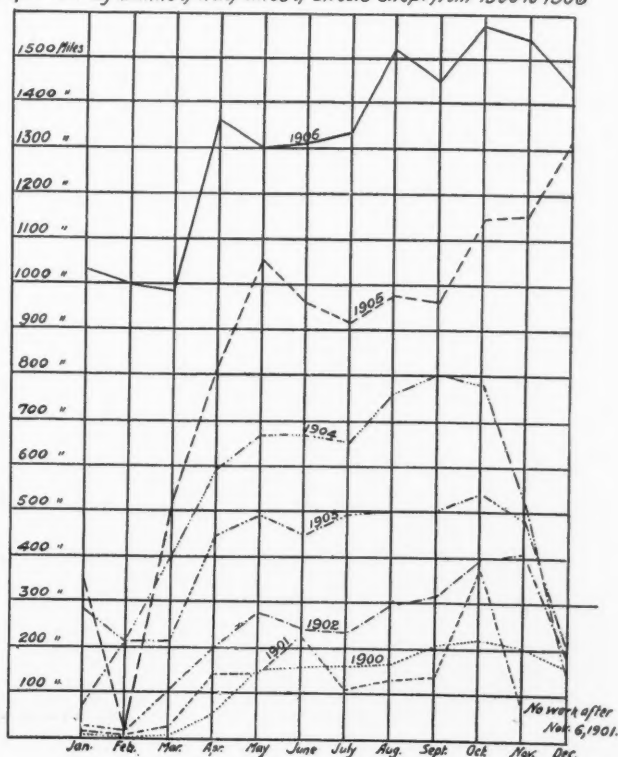
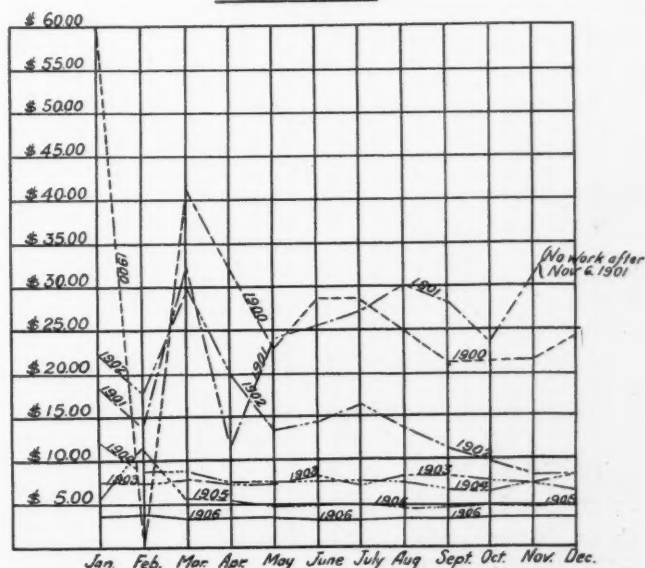


Table No. 3
Bureau of Street Cleaning
Borough of Richmond
Cost per mile by months of Streets swept
from
1900 to 1906.





OLD-STYLE CAR OF THE BETTER TYPE
Used by Borough of Richmond until late in 1904

service, the carts were unsanitary (see illustration) and the change to municipal ownership and operation of the service has been justified both from a sanitary and economic point of view. The question of economical collection of refuse has not, Mr. Fetherston believes, received the attention it deserves, since he finds that the cost of collection of this material is generally two or three times the cost of its disposal.

In connection with the methods of cost keeping, he states that previous to 1905 costs were not systematically kept and monthly and annual statements served the purpose, later displaced by the more effective system explained below. It became necessary in 1905 to increase the amount of work performed by employees in proportion to the increase of wages which was then proposed. An analysis of the result obtained in former years was summarized in what was called a foreman's guide, and by means of the figures so obtained new schedules were made out. New sections were laid out on this basis, and the men showed their appreciation of the increased wage by performing even more work than was expected with less trouble to the foremen and greater interest in their work.

With this introduction and general explanation, abstracted from letters from Mr. Fetherston, we give the description of the method of cost keeping and of compiling efficiency records, as prepared for this journal by him.

THE Superintendent of Street Cleaning is appointed by the President of the Borough, and reports directly to the Commissioner of Public Works. Street cleaning work in Richmond Borough involves all work usually performed by street cleaning departments, in addition to various maintenance work advisable because of local conditions. At the present time, the officers of the Bureau of Street Cleaning are as follows: Superintendent, one assistant superintendent, four clerks, three inspectors, nine section foremen, two stable foremen and two assistant stable foremen.

There are also 198 laborers, sweepers, drivers and hostlers and 8 hired carts collecting refuse from the country districts of the Borough.

The island is divided into three districts. Two districts contain two sections each, and one is composed of three sections, each section headed by a foreman, and each district in charge of an inspector. The assistant



NEW STYLE OF CITY CART—INSTALLED OCTOBER, 1904

superintendent supervises all outdoor work. There are two municipal stables ("A" and "B"), where horses and carts are maintained for the refuse collection service and other driving or hauling work. There is one crematory in operation for the burning of garbage.

Daily Reports.—Daily reports (see sample A), giving name of each employee, time, kind and amount of work performed, classified as stated in Appendix A, are furnished by the foremen of each of the seven sections, two stables and crematory. They are checked by the district inspectors, reviewed by the Superintendent, and filed in the office. These reports form the basis of the clerical work and the cost-keeping method of the Bureau.

Summaries on Daily Reports.—The work for the day is summarized on each report; that is, the kind of work, total time and quantity of work performed by laborers and drivers are given. The drivers' time represents also the time of the horses in their charge.

Card System.—A monthly card system (see sample B) is maintained for the sections, stables and crematory. To these cards are transferred the summaries on the daily reports.

Horses—Stables "A" and "B".—There are seventy horses in both stables. Of these several are known as street cleaning light-driving horses and are used by the inspectors; some belong to other Bureaus, being maintained by this Bureau, and the remainder are termed "work horses." Stable "A" maintains the horses engaged in the refuse collection service of sections 4, 5, 6 and 7, while Stable "B" covers sections 1, 2 and 3.

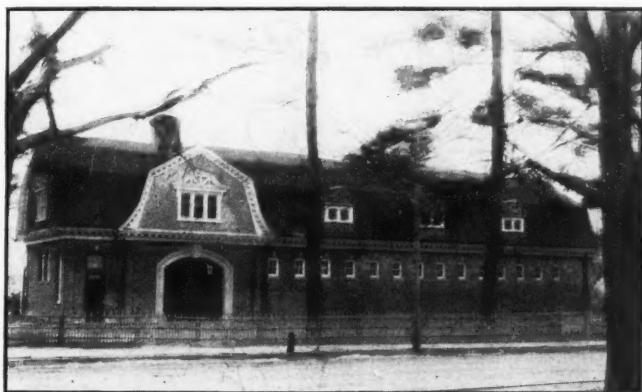
The foreman of each stable furnishes the Superintendent with a weekly report (see sample C) on the condition



STABLE A, SWAN STREET, TOMPKINSVILLE, N. Y.
Capacity, 42 horses

of the horses under his care, their daily condition, the number of horses shod and those treated by veterinary. There is kept in the stables a record of each horse, date of purchase, etc. Stable foremen supply the office with a report on the weights of the horses three times a year. They also report the amount of forage received, consumed and on hand at the end of the month, and the number of horses cared for each day and for the whole month (see sample D).

Stable Maintenance Account.—The accompanying sheet, designated E, shows in detail: First—The method of arriving at the maintenance cost of all horses in the Borough stables. This sheet covers charges for upkeep of horses, including payrolls of stable foremen and assistant foremen and of hostlers, cost of forage consumed, veterinary services, supplies and repairs. Second—The apportionment of stable maintenance among the horses of other Bureaus which are cared for by the Bureau of Street Cleaning, the cost of such maintenance being repaid by transfer of funds. Third—The cost of maintenance of street cleaning work horses. This amount represents the difference between the total maintenance mentioned above and the cost of maintaining horses of other Bureaus,



STABLE B, COLUMBIA STREET, WEST NEW BRIGHTON, N. Y.
CAPACITY, TWENTY-EIGHT HORSES.

plus specific work-horse charges for horseshoeing, repairs and supplies. Fourth—Horse hours for each class of work either by carts or teams, and the total horse hours for all street cleaning work. These figures are shown on the cards. Fifth—The unit cost per horse-hour. This rate is arrived at by dividing the total horse-hours into the amount of stable maintenance for work horses only. Sixth—A tabulation of charges for stable maintenance against the various kinds of work; also a division of the drivers' payrolls. Seventh—The drivers' payrolls, plus the work horse maintenance, represent the cost to the Bureau of Street Cleaning of maintaining stables "A" and "B." A condensation of the stable maintenance account is made up each month (see sample F) and copies are sent to each stable foreman, who is thus informed of the cost of work in his charge.

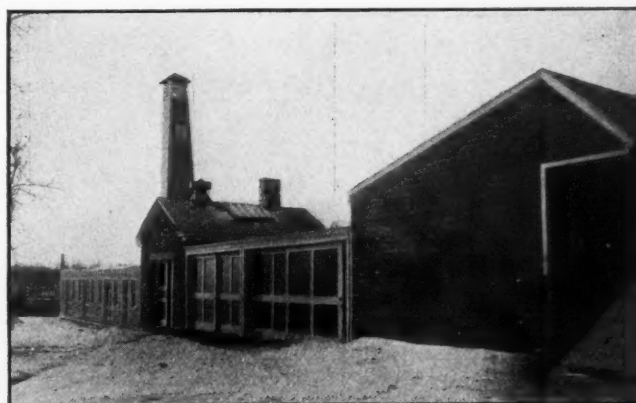
Monthly Statement.—Each month a statement of expenditures, quantities and unit costs of work performed is made up (see sample G).

Other Statements.—Twice each year a complete statement and report is made to the President of the Borough.

The semi-annual statement covers work performed during the first six months of the year (sample I); the annual statement (sample J) covers the whole year's work, discusses in some detail the various features of the work performed, and compares the results obtained with those of former years.

Supervision.—Supervision is of two kinds—by inspectors and by foremen. The payrolls of both for the month are secured and apportionment is made among all classes of street cleaning work. The supervision for refuse collection "carts" and "teams" is arbitrary, but for the rest of the work it is proportional (see sample H). The figures under "Labor" represent the laborers' payroll, and are obtained from the cards. The amounts shown under "Carts" and "Teams" are taken from the stable maintenance account. The cost of hired carts is generally charged to "Refuse Collection Carts." There remain two items, "Supplies" and "Stable Maintenance." Under "Supplies" all small articles necessary for the performance of each class of work are charged. The item "Stable Maintenance" shows the apportionment among the different kinds of work of the cost of caring for the light driving horses used by inspectors. "Miscellaneous": Here are found the charges against the different Bureaus for care of their horses, harness, repair of wagons, etc.; also all bills for supplies used expressly for the maintenance of their horses or the repair of wagons. "Miscellaneous" also contains such items of street cleaning work as cannot properly be charged elsewhere. The remaining items in the statement are self-explanatory, except perhaps the "Recapitulation." This shows the total expenditures, which are obtained from the time book, requisition book, forage reports, etc., etc., and should check with the total amounts paid out, as shown on the section, stable and crematory cards, stable maintenance account and supplies book.

Supplies.—When supplies are needed, requisition is made by the Superintendent on the Commissioner of Public Works. The formal city order to the contractor is sent by the Commissioner. Supplies amounting to \$1,000 or over are purchased on contract. Foremen maintain records of supplies received, disbursed and used by their men. Each employee is held personally responsi-



CART, BUGGY AND AUTOMOBILE SHEDS, BLACKSMITH SHOPS, SECTION HOUSES AND HOSE TOWER. HOSE TOWER USED BY BUREAU OF SEWERS AND SAID TO DOUBLE LIFE OF HOSE.

ble for supplies charged against him. About the first of each month the Acting Assistant Superintendent formally condemns all useless articles, which are embodied in a report to the Superintendent. Such supplies are burned at the crematory. The stable foremen twice a year make an accounting to the Superintendent of all supplies received, disbursed, on hand and condemned.

Bills.—Bills are forwarded to the office, checked and apportioned in a supplies book, which shows the amount of supplies charged against each class of work for the month.

Bookkeeping.—A ledger account is kept with each classification of street cleaning work and with other Bureaus. The general appropriation is divided among the various kinds of work at the beginning of each year according to the amount of work done the previous year; thus it is possible to keep a debit and credit account with each class of work. A day book is also maintained. The men's time is entered daily into a time book from the reports, and the weekly payroll is made therefrom.

Individual Records.—Individual record cards (see sample L), showing hours worked and quantity of work done daily by each employee, are kept. A bulletin (sample M) is published bi-monthly, giving the average cost of work done by individuals and by sections (N). The work covered by these cards varies with the seasons of the year. Sweeping and gutters are recorded throughout the year, but at different times of the year other work is taken on, such as cleaning crosswalks in winter, etc. These records keep the foremen and laborers up to their work, and form the basis of an efficiency record of individual employees, which is summarized twice each year. Promotions in service are based on this record (see sample O). A record is also kept of all employees, showing date of entry into Bureau, badge number, residence, compensation, where assigned, and such other data deemed necessary. From time to time the Superintendent issues special orders covering the government of the men, manner of performance of work, care of supplies, property, etc. (Sample P).

SAMPLE A FOREMAN'S DAILY REPORT

MARCH 19, 1907. WEATHER CLEAR.

I was at the following places and met carts at the times indicated:

6:45 A.M. 12:45 P.M.
7:00 A.M. 1:00 P.M.
etc. etc.

Have you had your bicycle with you all day? If not state when and why not.
Have you seen every sweeper in your section at least twice during the day?
If less than twice in any case state the reason.
Do you know that every man worked full time?
Were you personally present at morning roll call? At evening roll call? Did you line up your men and give them a thorough inspection in the morning? Did you inspect all of your men at evening roll call, and did you find them all sober and in good condition? If not, state particulars.

REPORT ON CONDITION OF SECTION TO-DAY

Give Names of Streets material is left out on at end of day's work.

SWEEPING AND CLEANING

NAME	SWEEPING				CLEANING CROSSWALKS				CLEANING GUTTERS		
	Hours	Hours	Route	Dist'ce Feet	Hours	Route	Sta.	Feet	Hours	Route	Feet
Ed. Quinlan, Foreman.....	9	..	..	..	..	..	..	..	..	..	..
Buttermark, Thos.....	9	3	5a	1,200	3	1	12	871	2	5a	800

REFUSE COLLECTED AND DISPOSED OF

DRIVER	Hours	Cart No.	IN LOTS AND ON WASTE LAND					AT CREMATORY			Total	Remarks
			Ashes	Garbage	Sweepings	Paper	Snow and Ice	Garb. Hired Carts	Garb. Private Carts	Paper		
Scaramuzza, Jos.....	8	1	2	1½	...	½	..	...	...	...	4	All drivers of garbage carts reported their routes cleaned.
Pride, Chas.....	8	3	2	1	...	1	1	...	...	...	5	

RETURN OF FOREMAN OF STABLE "B" OF WORK PERFORMED BY HOSTLERS AND DRIVERS, MARCH 26, 1907

NO. OF HORSE	Cart or Machine	Name of Driver	Hours	Work Performed	Left Stable	Returned	Remarks
Foreman	George Spong.....	8	7:30 A.M.	7:15 P.M.	Detailed to crematory pump.
Hostlers .....	..	Robert Ivey.....	8	A G P Sw.	4:00 A.M.	1:00 P.M.
52.....	22	James J. Breen....	8	2 1 ½	7:00 A.M.	4:05 P.M.	
45	29	James Cardell.....	8	3 ½ ½	7:00 A.M.	4:10 P.M.	
.....	..	Henry Gartman....	...	.....	.....	.....

SAMPLE B

BOROUGH OF RICHMOND—BUREAU OF STREET CLEANING

CLASS OF WORK, *Stable B.* MONTH OF JANUARY, 1907. SECTION NO.

DATE	LABOR				SUPER.		DATE	LABOR				SUPER.	
	2.00	1.97	2.50	2.13	1,200	900		1.97	2.25	3.25	2.13	1,200	900
1	..	16	..	16	8	8	16	16	..	..	24	8	8
2	..	16	..	16	8	8	17	24	..	..	16	8	8
3	..	16	..	24	8	8	18	24	..	..	16	8	8

DATE	LABOR						DRIVING						Team	No Horse	Quantities
	2.00	1.97	2.50	2.13			2.00	1.97	2.25	3.25	2.13				
1	40	..	8	..	..	4	..	4-55½
2	46	..	8	..	..	3	..	4-65½
3	..	3	..	..	..	..	..	46	..	..	..	..	..	..	....

SAMPLE C

REPORT OF CONDITION OF STABLE B, B. S. C.

FOR THE WEEK ENDING, 190.....

This form is too long and complicated to be reproduced. On it are noted for each day of the week the number of foremen, assistant foremen, hostlers, hostlers acting as watchmen; regular drivers employed on ash carts, on sweeping carts, machines, wagons, stable duty, extra carts; extra drivers employed on the same; mechanics, mechanics' helpers; B. S. C. horses on carts, wagons, machines, driving, resting in stable, on trial; horse on carts, wagons, and driving for sewer work, highway or topographical, by engineers or the Commissioner of Public Works. Also date and number of each horse shed, and by whom, and the same concerning veterinarian service; also repairs and by whom. A Property Account is made out, recording under the heads B. S. C., Sewers, Highways, Engineers, Topographical and Commissioner of Public Works, the various items of ash carts and trucks, light wagons, machines, water carts, snow plows, reach trucks, snow scrapers, paper carts, stone wagons, three-seat wagons, trucks, horse rollers, stone carts, sleighs; cart covers, street, stable, and quarter blankets, collars in use and extra, feed bags in use and extra, slings, fur robes, lap robes, whip, halters, sheets.

SAMPLE D

Monthly Report of Forage Received, Consumed and Remaining on Hand at

STABLE A. *March 31, 1907*

RECEIVED AND ISSUED	Oats Lbs.	Hay Lbs.	Straw Lbs.	Bran Lbs.	Oil Meal Lbs.	Oat Meal Lbs.	Fine Salt Lbs.	Salt Bricks Lbs.	Ground Feed Lbs.	Lbs.
On hand, March 1.....	51,948	7,200	800	1,000	.....	.....	.....	.....	.....	.....
Received, March 6.....	.....	.....	864	.....	.....	.....	.....	.....	.....	.....
Received, March 9.....	.....	2,166	.....	.....	.....	.....	.....	.....	.....	.....
.....
.....
.....
.....
.....
.....
.....
Total accountable for.....	51,948	34,581	4,370	2,000	100	.....	100	60	.....	.....
Consumed.....	26,948	25,081	3,070	1,500	40	.....	25	24	.....	\$676.80
Remaining on hand.....	25,000	9,500	1,300	500	60	.....	75	36	.....	.....

(There is also a tabulated statement of the number of horses fed each day.)

SAMPLE E

BOROUGH STABLES

General Stable Maintenance

[illegible][illegible]

SAMPLE H

SUPERVISION

MARCH, 1907

CLASS OF WORK	Hours of Labor	Hours of Driving	Foremen's Apport't	Foremen	Inspectors	Foremen	Inspectors	Total Supervision
Ref. Collect.....	52	1568 9,221	.964 64.000	64.964	32.4820	79.49	52.85	\$132.34
Gutters.....	8,303	.....	152.894	152.894	76.4470	187.08	124.38	311.46
Crosswalks.....	1,635	.....	30.141	30.141	15.0705	36.88	24.52	61.40
Sidewalks.....	642	.....	11.828	11.828	5.9140	14.47	9.62	24.09
Snow Removal.....	535	1,346	9.857 8.000	17.858	8.9285	21.85	14.53	36.38
Sprinkling Ashes—Ashing.....	2,006	107	36.975 .640	37.615	18.8075	46.03	30.60	76.63
Cost of Material.....	.....	2	.013 173.485 1.216	.013	.0065	.02	.01	.03
Sweeping.....	9,415	205	.284	174.985	87.4925	214.11	142.45	356.56
F. D. Ashes.....	1,166	.....	21.467	21.467	10.7335	26.27	17.46	43.73
Light Repairs B. S. C.....	11	7	.197 .039	.236	.1180	.29	.19	.48
	23,765	.....	512.000	.....	256.0000	626.49	416.61	1,043.10

SAMPLES I AND K

These are in the same form as Sample G, except that several items are added, such as "Snow Removal," as the exigencies require

SAMPLE L

Individual Records—Borough of Richmond, Bureau of Street Cleaning

NAME, *Bade*. MONTH OF *April*, 1907. SECTION NO. *I*.

Date	SWEEPING		GUTTERS		WEEDING		NON-PROD.	Date	SWEEPING		GUTTERS		WEEDING		NON-PROD.
	Hrs.	Feet	Hrs.	Feet	Hrs.	Sq. Yds.	Hours		Hrs.	Feet	Hrs.	Feet	Hrs.	Sq. Yds.	Hours
1	6	31.00	2	10.00	.....	.....	.....	16	.....	.....	.....	.....	.....	.....	.....
2	8	30.00	.....	.....	.....	.....	.....	17	.....	.....	.....	.....	.....	.....	.....
Etc.	.....	.....	.....	.....	.....	.....	.....	Etc.	.....	.....	.....	.....	.....	.....	.....
Labor	.....	\$24.17	.....	\$4.03	.....	\$1.44	.....	.....	.....	.....	.....	.....	.....	.....	.....
Super.	.....	8.40	.....	1.40	.....	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	.....	32.57	.....	5.43	.....	1.94	.....	.....	.....	.....	.....	.....	.....	.....	.....
Work unit	.....	7.3	.....	1.3	.....	0.2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cost	.....	4.45	.....	4.17	.....	9.70	.....	.....	.....	.....	.....	.....	.....	.....	.....

SAMPLE M

Sweeping Costs and Efficiency Record

January 1 to 15, 1906

SECTION L

	Cost		Miles Swept	Cost Per Mile	EFFICIENCY RECORD					
	Labor	Super.			1	2	3	4	5	Total
Abbate.....	\$17.55	\$6.10	2.6	\$9.09	...	...	...	...	...	.....
Bade.....	16.40	5.70	3.4	6.50	...	...	...	...	...	.....

SAMPLE N

Sweeping by Sections.—Efficiency of Foremen

January 1 to 15, 1906

SECTIONS	Miles Swept	Total Cost	Cost Per Mile	EFFICIENCY RECORD					
				1	2	3	4	5	Total
I	59.6	\$336.77	\$5.65	...	...	...	...	...	.....
II	51.5	270.39	5.25	...	...	...	...	...	.....

SAMPLE O

Individual Records

Employees shall be marked on the 1st and 15th of each month with regard to the following items:

ITEMS.

1. *Quantity of Work*.—Whether the amount of work performed is such as is reasonable to expect from a first-class, able-bodied willing man; considering, of course, the relative difficulties of the work.

2. *Quality of Work.*—Whether the quality of the work performed is such as should be expected from a careful and conscientious man, who takes pride in performing his work well.

3. *Discipline.*—Whether there is cheerful and intelligent obedience to the rules of the service and the foreman's or inspector's orders.

4. *Complaints.*—Whether any complaints have been made since the last marking.

5. *Days Absent.*—Number of days absent.

Special Notes.—Under this heading any notes affecting the marking of the numbered items should be recorded. The five hundred items shall be marked on the following basis:

- 10 marks for Excellent.
- 9 marks for Good.
- 7 marks for Fair.
- 5 marks for Poor.
- 0 marks for Failure.

Intermediate markings by the officers of the bureau will be based on personal judgment. The passing mark shall be fixed at 6.

A standard of excellence in all numbered items will be determined as soon as possible; in the meantime, the number 10 (excellent) will be considered as applying only to such men as have shown extra ability under numbered items 1, 2 and 3. In items 4 and 5, Excellent (10) may be used where there are no absences and no complaints. (Signed) J. T. FETHERSTON,

Dated, June 26, 1905.

Asst. Engr. and Act. Supt. of Street Cleaning.

SAMPLE P

Bureau of Street Cleaning, Borough of Richmond. Special Order No. 48.

SUNDAY WORK.

In order to prevent confusion during the winter season, when snow falls or ice forms on Saturday or Sunday, foremen are hereby directed to order their men to report at some designated place at 8 A. M. Sunday. In snowstorms, the men shall report as soon as the snow has stopped falling, provided it is not later than 3 P. M. With icy sidewalks, men shall report at 8 A. M. Sunday, when work will continue until crosswalks, sidewalks and roadways are sprinkled with ashes so as to be safe for traffic.

In other words, men must report as soon as the snow ceases falling on Sundays, and at 8 A. M. Sundays in case of slippery walks, whether the storm continues or not.

As sweeping carts and extra drivers will be required to assist the laborers in spreading ashes during icy periods, foremen should order sweeping carts to report at a designated place with the sweepers.

In case of a heavy snowstorm, all drivers must report on Sundays at the city stables as soon as the snow has stopped falling, provided the fall of snow is three (3) inches or more in depth.

Inspectors and foremen will see that these orders are carried out.

January 19, 1906.

(Signed) J. T. FETHERSTON,
Superintendent of Street Cleaning.

APPENDIX A.

FOREMAN'S GUIDE

All kinds of work performed in the street cleaning bureau must be classified under the following headings:

1. *Sweeping.* The cleaning of roadways from curb to curb by hand, hand machine or horse machine. Report number of feet cleaned, name of road, location (stations), where swept and hours of labor.

2. *Refuse Collection.* Report number of loads of different kinds of refuse and streets where materials have not been collected.

3. *Final Disposal.* The disposal of city refuse, mainly at City Crematory, West New Brighton. Also men on dumps. Report amount of garbage and hours of labor at crematory, and hours of labor at dumps.

4. *Snow Removal.* The removal of snow from roadways, etc. Report name of street, location, number of loads and hours of labor.

5. *Cleaning Gutters.* The removal of ice, snow, sand or dirt in large quantities from gutters, after storms or because of unusual conditions necessitating the use of hoe or shovel. Report name of street, location, length cleaned and hours of labor.

6. *Cleaning Crosswalks.* Removal of ice, snow, dirt, etc., from crosswalks. Report route number, number of crossings cleaned, length of walk (on basis of single crosswalk) and hours when cleaned.

7. *Cleaning Sidewalks.* Removal of ice, snow, dirt, etc., from sidewalks. Report accurate location of property as explained in detail by acting superintendent, distance cleaned, hours of supervision and hours of labor.

8. *Light Repairs.* Patching of macadam roadways. Report route number and location by stations, area of patch, amount and size of stone used, and hours of labor.

9. *Weeding.* Removing weeds by hand, hoe, or machine. Report length and average width weeded, hours of labor, carts, teams, etc.

10. *Sprinkling Ashes.* The spreading of ashes on roadways, crosswalks, sidewalks, etc. Report location of work, time performed, amount of ashes used in cubic yards or wheelbarrow loads for roadways, and lineal feet for sidewalks and crosswalks, hours of labor, carts, etc.

11. *Special Snow Removal.* Cleaning sidewalks. Removal of ice, snow, dirt, etc. Write name of street (do not use route

numbers). * * * Get number of feet cleaned, from actual measurements taken on ground, whether property contains house or is vacant, with time for supervision and labor.

12. *Miscellaneous Work.* All kinds of work performed in the Bureau which cannot be properly reported under any of the above headings.

(Route numbers are to be used instead of street names. Apportionments of time are to be made in red ink, so as to avoid confusion with route numbers.)

AVERAGE AMOUNT OF WORK DONE PER MAN PER DAY

KIND OF WORK	Figures From 1904 Report	1905. MEN DRAWING \$7.20 SALARY	
		Increase in Salary	Amounts Increased in proportion to Salary
1. Sweeping.....	2,100 ft.	16 per cent.	2,500 ft.
2. Refuse collection....	6 loads	12 " "	7 loads
3. Final disposal.....	" " "	" " "	" " "
4. Snow removal.....	33 loads	12 " "	37 loads
5. Cleaning gutters.....	850 ft.	16 " "	980 ft.
6. Cleaning crosswalks..	800 ft.	16 " "	930 ft.
7. Cleaning sidewalks..	640 ft.	16 " "	740 ft.
8. Light repairs.....	16 sq. yds.	16 " "	18½ sq. yds.
9. Weeding.....	400 sq. yds.	16 " "	464 sq. yds.

Increase in salary should mean increase in efficiency. The above figures make the case plain.

An employee on an annual salary receives no extra pay for overtime; in other words, the hours of work are limited only by the requirements of the particular duty to which a man may be assigned. Each day's work must be completed, regardless of the time required, though ordinarily eight hours is considered a full day for laborers. Foremen will be required to spend at least nine hours on their sections, so that their reports may be complete. Each Inspector must be able to check his foreman's reports, particularly as to hours of labor and quantity of work performed. This involves presence at morning roll call, orders for the day's work, visits through the district, checking and signing reports, planning for future work, etc.

It will thus be seen that, contrary to some ideas, the higher the position a man occupies in the Street Cleaning Bureau the greater is the amount of work required of him.

J. T. FETHERSTON,
Asst. Engineer and Acting Supt. of Street Cleaning.

HISTORY OF POLICE ADMINISTRATION

Ancient Police Forces—Early English Police—Modern English Police—French Police—United States Police—Police of Germany and Other Countries.

By LEONHARD FELIX FULD, M. A.

ALTHOUGH police conditions in ancient days were so different from what they are to-day that a careful study of the Greek and Roman police systems would scarcely be of value to us, it might nevertheless not be unappropriate to mention some of their salient characteristics. Since the ancient Greeks enjoyed no constitutional immunity from governmental action, the police power was co-extensive with the entire public activity of the city state. There was, however, no police force to maintain order in the city; the police duties were attended to by several bodies of magistrates, the most important of whom were the *Astynomi* or street supervisors. These magistrates, ten in number, were charged by law with the duty of having the streets swept, securing decency and morality on the streets and supervising the construction of new buildings. In addition to these executive duties they had the judicial function of deciding all law suits which involved questions coming within their jurisdiction. Other police duties were looked after by the aqueduct magistrates, the market magistrates and the corn magistrates—each consisting of a board of ten magistrates performing the police duties indicated by the titles of their respective offices. But, while the Greeks had no police force in any way similar to modern police organizations, the Roman police system was strikingly similar to our own. A body of about seven thousand constables or *vigiles* grouped into precincts and divisions looked after the peace of Rome, just as modern policemen perform their work. These police officers had regular tours of duty, and although it is not certain that a systematic patrol of the streets was maintained, yet complaints of police inefficiency were not more frequent than they are with us to-day. In addition to their police duties the Roman policemen were also the city's firemen, the differentiation of the fire-fighting function being of more modern origin. During the feudal centuries we find no trace of any organized police systems, although the manorial lords exercised police jurisdiction in connection with their judicial functions. In the mediæval free cities this police jurisdiction passed from the lords to the city authorities, but there was no patrol service or organized police force in the modern sense of the word.

EARLY ENGLISH POLICE

Among a free people most agencies of the government are decentralized, decentralization being the technical legal term for local home rule. We are, therefore, not at all surprised to find that the English police system was originally decentralized. The origin of the English police was the Anglo-Saxon doctrine of mutual suretyship. Under penalty of imprisonment, each freeborn citizen was compelled to join a company of ten men called

a decennary, and these decennaries were in turn compelled to form hundreds. Each individual thus became responsible for the forthcoming of his neighbor in the event of any criminal charge being brought against him. If at any time the King's peace was violated it was the duty of the county where the breach of the peace occurred to find out the hundred to which the offender belonged, the hundred to discover the decennary, and the decennary to produce the criminal or be amerced, and in many instances make good the damage done. In a sparsely settled community, where everyone knew his neighbor this police system worked admirably, and the heavy penalty imposed upon the members of the decennary in case they could not produce the criminal served as a strong incentive to their ferreting out the wrong-doer.

With the growth of the country and the increase in population the ancient police system proved entirely inadequate. The decennaries and hundreds were broken up, and even before they became disintegrated it was impossible for them to deliver offenders to the courts. Responsible men were gradually relieved from the obligations of the frank pledge and the disturbances which arose on the occasion of the deposition of King Edward II. made necessary the appointment of justices of the peace to replace the police system of mutual suretyship which had now fallen into decay. An attempt was also made to make criminal penalties more severe, with the result that, since larceny was a felony punishable by death as well as murder, the thief did not hesitate to kill his victim. Such an act made his work easier, his detection more unlikely, and his punishment in no event greater. Almost every offense was a felony, and most felonies were punished with the death penalty. Yet, though hundreds were hanged every week, this did not serve to check crime in the least. Those criminally inclined attended the public executions regularly and looked forward to their own execution as the "crowning event in a busy life." Indeed, when larceny was a capital offense pickpockets plied their trade among the crowd watching the executions. Another method employed to check this era of crime was by offering large rewards for the apprehension of felons. Instead of checking crime, these rewards were a government subsidy for the encouragement of felony. Forty pounds was the reward offered for the conviction of certain offenders, and it was obviously to the advantage of the professional thief-taker not to interfere with a promising young criminal until he should commit a forty-pounds crime. Premature conviction was tantamount to killing the goose that should lay the golden egg, and the common cant phrase of the day was "he does not weigh forty pounds yet."

When the old Anglo-Saxon police system of mutual suretyship fell into disuse the police power in England was in the hands of justices of the peace and parish constables, who were in some respects considered rather as servants of the justices than as public officers. In addition the inhabitants of towns were charged with the duty of keeping watch and ward by the statute of Winchester. The jurisdiction of these parish constables was severely

local, since they had no authority outside of their own district. Their services, furthermore, were rendered gratuitously, although in a few cases constables were hired. Later the duty of watching was attended to in the towns by ruffians engaged by the citizens to act as their personal substitutes, and in the rural districts by paupers and other social derelicts. The first step in the reformation of English police administration came when an honest man with a salary was appointed magistrate of the Bow Street Court in London. The improvement which followed was so remarkable that by the Middlesex Justices' Bill in 1792 seven more salaried police magistrates were provided for London. The executive branch of the police force, however, still continued in its primitive inefficiency. Parliamentary committees of inquiry were appointed in 1772, 1793, 1812, 1816, 1817, 1818 and 1822, but they accomplished very little. Popular prejudice and the fear of governmental tyranny opposed the central control, or even the central supervision of the police. Under the pressure of circumstances, however, the phenomenal increase in crime at this period gradually forced the government to take some measures to improve the executive police service, especially in the metropolis of London. A four-mile foot patrol was established at the beginning of the nineteenth century; a twenty-mile horse patrol followed in 1805. These patrols, which were under the control of the central government, aimed mainly to suppress highway robbery on the roads leading to London, and they were entirely successful in their efforts. Lord Sidmouth, in 1821, introduced the first systematic patrol of London streets, but all police patrols were strictly confined to the early hours of the evening. During the day-time no police patrol was deemed necessary and thieves were left unmolested. At night the need of a police patrol was especially felt because the night watchmen, being undisciplined and unpaid, and following other vocations during the day-time, spent most of the night sleeping.

LONDON POLICE

The modern police force of the metropolis of London dates from 1828. In that year Mr. Peel, Secretary of State for the Home Department, secured the passage of a statute by which the old parochial organizations for police purposes were abolished and a new constabulary established for the entire district under commissioners appointed by the Crown. This was the first modern urban police force in the world, including a thoroughly organized corps of policemen subject to strict training and discipline, a systematic day and night patrol of the whole area, which was divided into definite beats for each officer, a force of reserves stationed at police headquarters, and mobilizing arrangements for suppressing serious tumults. Three predominating characteristics differentiate the police force of Peel from all preexisting police organizations. In the first place, the policemen were all professionals. Just as in our day we have seen the professional fireman taking the place of the volunteer, so by Peel's Act the inadequately paid watchman gave way

to the paid policeman, who devoted his whole time to his police duties and was forbidden to engage in any other business. The constables and watchmen had no organization or discipline and no administrative head worthy of that name; now the police force is uniformed and disciplined and under the control of a commissioner. And thirdly, all prior police forces were either civilian like the night-watchmen or military, as on the continent of Europe; now, on the other hand, the police force is semi-military. It is sufficiently military to secure effective action and good discipline, while yet not military to such an extent as to become oppressive as in Russia. Since it was not deemed expedient to provoke unnecessary hostility by attempting to do too much at first, the act of 1828 did not abolish the police of the city of London, the Thames River police or the constables of the magistrates. In 1839, however, the Thames River police and the constables of the magistrates were absorbed into the metropolitan police system, while in the same year the city of London reorganized its little police force on the model of the metropolitan police force. Yet even at the present day the city of London police is an organization separate and distinct from the metropolitan police. The metropolitan police force of Peel proved to be extremely efficient. In certain districts of London, which a squad of police could not with safety have entered to serve a warrant in 1820, a single officer could make an arrest unaided in 1830. The knowledge that a highly disciplined and centralized police force stood ready at all times to protect each individual policeman had a wonderful deterrent effect upon the criminal element.

MODERN ENGLISH POLICE

A novelty in governmental affairs is generally unpopular, and when this innovation is introduced into the system of police administration it is almost invariably unpopular among English-speaking people, who respect the rights of criminals more than the wrongs of honest men. Accordingly the new metropolitan police, in spite of its efficiency, was extremely unpopular. So unpopular was it in fact that when a policeman was mortally stabbed in the Cold Bath Fields Meeting riots of 1833 the coroner's jury brought in a verdict of justifiable homicide, which was promptly set aside by the courts as contrary to the facts. The nicknames of Bobby and Peeler, derived from the name of Robert Peel, who secured the establishment of the metropolitan police, were given to the London policemen at this time when they were so unpopular, and these nicknames have clung to them to the present day. Popular opposition to the police became so acute in 1833 that three Parliamentary committees were appointed to investigate the police force, the result of which was that the police commissioners received unqualified approbation. By the municipal improvement act of 1834 the formation of similarly organized bodies of police was authorized in all corporate towns, such police to be under the control of the Mayor and the Watch Committee of the municipal council. In 1839 the formation of county police for the rural districts was authorized, but since the counties were

slow to take advantage of this permissive legislation, the system of county police was made compulsory in 1856, and at the same time a scheme of inspection of all the local police by the central government was organized in connection with the subsidies paid by the central government towards the cost of the local police.

FRENCH POLICE

Almost every country has a primary and a secondary police organization. Thus, in England, if the city police or the rural police is unable to quell a disturbance, the British army is called upon to restore quiet. In the United States, the State militia, an organized body of volunteer citizen soldiers, is called upon to assist the police in cases of extreme emergency, and, in addition, if the militia fails to restore quiet, the Legislature of the State, or, if it is not in session, the Governor can call upon the President of the United States for United States Army troops. France, on the other hand, was the first country to have a dual police system, a civil police and a military police—the gendarmerie—performing police duties of different kinds at the same time. In addition to this dual primary organization, it has of course a secondary police organization—the regular army—to fall back upon if necessary. Philip of Valois took the first step towards establishing a modern police system in 1327, when he appointed in Paris a number of *commissaires*, royal officers distinct from the judicial system, with power to conduct preliminary examinations in the enforcement of police regulations. This same system of separate police magistrates was extended to other parts of France in 1514, when similar *commissaires* were appointed in each royal *baillage*. The establishment of the *maréchaussée* in 1356, and its reorganization as the gendarmerie in 1720, the appointment of a lieutenant of police for Paris in 1667, and the extension of the military urban police patrol service to every town possessing a *parlement* or presidial court two years later, made France in the seventeenth and eighteenth centuries one of the best policed countries in the world. In Paris the police, which was practically a military force, was stationed at strategic points about the city during the day-time, while at night a systematic patrol of the streets in squads was maintained. In the rural districts the principal function of the police was the detection and suppression of attacks upon the government, and for all serious outbreaks in city or country the army was called into action.

Not until 1854 was the Paris civil police reorganized on the model of the London metropolitan police. At this time it lost its military character. The number of policemen was increased from four hundred to three thousand, and, being placed under the direct control of the central government, a part of the expense of its maintenance was borne by the central government. The police of Paris is under the administrative supervision of a prefect of police, who is an officer of high rank appointed by the central government, and whose police duties are analogous to those of the Commissioner of Police of London. The police force of Paris may be divided into two divisions—

the political police and the civil police. The political police of necessity works in the dark. Those who plot against the existence of the State work in secret, and the government agents who are pitted against them—whether they be regular police officers or paid spies—must also make as little display as possible. What the government gains in exposing and frustrating a treasonable conspiracy it quickly loses when the people begin to ask themselves: "Why did these men plot against their government?" The civil police organization consists of *commissaires*, inspectors, policemen and clerks. Paris is divided into twelve *arrondissements* or wards and forty-eight *quartiers* or precincts. In each *arrondissement* is a brigade of policemen and inspectors, and in each *quartier* a *commissaire*. These *commissaires* are a very efficient police agency peculiar to the French system. Appointed directly by the central administrative authorities, and not subject to the administrative control of the prefect of police, they combine duties somewhat similar to those of the American police magistrate with very important police duties. Complaints are presented to them and examined, arrests are recommended, and those arrested examined and sent to the *juge d'instruction*, the lowest officer in the criminal judiciary system. But their most important service is rendered when one of these *commissaires* prevents the commission of a crime or settles a quarrel without making an arrest—in other words, when he acts as a peacemaker, respected and obeyed by everyone. The prefect of police has the power to make police regulations having the force of law—the extensive executive ordinance power found mainly in continental Europe—and he has power to issue warrants for the arrest of offenders—a power reserved in England and America to the courts. Another important administrative characteristic of the Paris police organization is the large central reserve—a whole brigade being kept at the central office to meet possible emergencies—and the division of the policemen into specialized squads so seldom found in America. Almost every function of police administration is looked after by a special squad—vagrants, hacks, prostitutes, bankers, pawnbrokers, street traffic, etc.—and this specialization of function and division of labor has apparently increased the efficiency of the Paris police.

UNITED STATES POLICE

Since the United States were originally colonies of Great Britain, it is natural that early police conditions in America were similar to those in England in the eighteenth and the beginning of the nineteenth centuries. When the American cities were first settled and were very small, the city was generally placed in the care of a single paid night-watchman, whose duty it was to ring a bell at stated intervals, cry out the state of the weather and notify the constable in case of fire or disorder. A single constable was likewise the chief and only police officer. As the city grew the number of constables in each ward of the city was increased, and these constables were generally elected by the people. The number of night-watchmen was also increased, but the watch, as it was

called, was not a permanent body of paid men. Every able-bodied householder was supposed to take his turn, but instead he furnished a substitute, who was frequently not much more than a vagabond. The next step was generally a law authorizing the appointment and payment of a certain number of night-watchmen. Rules and regulations were also promulgated at this time. Frequent serious riots demonstrated to the citizens that a police administration which had no efficient organization, training or discipline was unsatisfactory. The result was that in the middle of the nineteenth century most of the American cities organized police forces patterned after the London police. At first considerable difficulty was experienced in compelling the policemen to wear a uniform, it being considered degrading to do so, but after considerable opposition every large American city succeeded in obtaining a semi-military uniformed professional police force. The establishment of these modern police forces served also to combine the functions of police and night-watching which were distinct in the early days, and which are still distinct in Berlin to-day. The next stage in American police development was the partial centralization of the police administration. Up to this point police administration had been considered a purely municipal affair in America, but in 1857 the police of Brooklyn and New York were placed in charge of a centrally appointed police commission. Similar metropolitan police systems were established in Baltimore, St. Louis, Chicago, Detroit, Cleveland, Boston, several other Massachusetts cities, Cincinnati, Washington, Denver, Newport, Kansas City, St. Joseph, Birmingham, Manchester, eleven Indiana cities and Providence. Dissatisfaction with the inefficiency of the urban police, and the desire to gain partisan advantage, were the principal motives leading to the establishment of a metropolitan police force. In New York, Chicago, Detroit and Cleveland a return has been made to the method of local appointment.

GERMAN POLICE

The German police system has always been, and is still to-day the most military system of urban police administration in the world. Before Germany had any police organization whatever the army attended to the policing of the cities as well as the policing of the rural districts. But although this was the condition of affairs in all civilized countries before the introduction of modern police organizations, yet the performance of police duty by the military has left a firmer impression upon the modern police in Germany than in any other country. No police force was organized in Germany to relieve the army from performing police service until 1812, and the gendarmerie established by Prussia in that year on the general lines of the French organization, was supposed to cover the entire State, and so could not give very much attention to the cities. In 1830 the Prussian government authorized the municipal authorities of any city in which no garrison was stationed to establish a local police force, but the need of a police force in cities containing a garrison was not yet felt, as the military attended to the policing of the gar-

risoned towns. Even in the ungarrisoned towns in which a police force was authorized in the first half of the nineteenth century, and later in the second half of the same century, when local police forces were authorized in all German towns, the police maintained order only in normal times. In times of tumult the German police always has called, and even to-day continues to call upon the military for assistance. The organization of the German municipal police also plainly shows that it is a child of the military. The patrolmen must all be trained soldiers, the inferior officers must be non-commissioned army officers of at least twelve years' standing, and all the other officers of the uniformed force are quite generally former army officers. Only the police commissioner and his assistants need not be soldiers, and even in the case of these men it is provided that they must either have served in the army or prove that they are physically disqualified for service. We should, however, not fall into the error of ascribing the military character of the German police organizations exclusively to the fact that the military continued to be the sole police organization in Germany for so long a time. Although the influence of this fact upon modern German police conditions is important, the compulsory character of the military service in Germany has also influenced German police affairs very materially. Where every able-bodied man must be a soldier it is only natural that the police force, which must in its very nature be at least quasi-military in organization, is in Germany developed into an almost complete military body.

OTHER COUNTRIES

In Turkey, Persia and China local action in police matters is at a minimum. In Turkey the policemen are members of the regular army, and only in Constantinople is any attempt made to differentiate the policeman from the soldier. In Persia there are policemen only at the capital, Teheran. In China there is no police organization whatever, police matters being attended to by various provincial authorities. In most of the British colonies the police system is no less completely centralized, although vastly better organized than in the semi-civilized countries first mentioned. India has a State police force, but the larger municipalities make contributions towards the support of the police force on duty within the city limits. Similarly the Royal Irish Constabulary is a strongly centralized organization, quasi-military in character. In Russia, too, the police is strongly centralized. The central government appoints a master of police for each city, who determines upon the strength, salaries, disciplinary rules and appointments. The municipalities, it is true, support both the urban police and the political police, but the central government makes this an obligatory item in the municipal budget. Similarly in Greece the police and the gendarmerie are maintained and controlled by the central government. The countries of Western Europe and North America quite generally allow the municipalities to take part in the management of the police. Most of these countries, recognizing the fact that the police function is a State function, but a State function in which the municipi-

pality is vitally interested, have a dual police system. In France, in addition to the local police, there is the gendarmerie. This military police organization has been copied in Belgium, Netherlands, Austria, Italy, Portugal, Spain, Mexico and most of the South American countries. In the United States the organization known as the militia, which is called upon only in cases of serious tumult, takes to a certain extent the place of the gendarmerie in the dual police system. Even where there is no general system of State police, the central government frequently controls directly the local police of the larger municipalities. London, Paris, Berlin and Vienna are familiar examples, although it should be borne in mind that Berlin has a local force of night-watchmen in addition to the government police. In Mexico, Rio, Buenos Ayres and Tokio the local police are similarly under the control of the central authorities, and the same condition of affairs exists also in some cities of the United States.

Shade Tree Legislation

An act providing for the planting and care of shade trees on the highways of the townships, first-class boroughs and cities of Pennsylvania, was passed by the Legislature of that State and approved by the Governor on May 31. This bill was prepared by, and introduced at the instance of, the American Civic Association, and an abstract is published in hope that it may prompt other States to adopt similar legislation, and may serve as a suggestion to others who desire to prepare acts to accomplish this purpose. Legislation of this kind is due to a growing recognition of the fact that shade trees in a city are an important public asset, and that they should be placed as much under public control as are the streets and sidewalks.

Section 1 provides that in the above mentioned communities of the State "there may be appointed, in the manner hereinafter provided, a Commission of three freeholders . . . who shall serve without compensation, and who shall have exclusive and absolute custody and control of, and power to plant, set out, remove, maintain, protect, and care for, shade trees on any of the public highways . . . the cost thereof to be provided for in the manner hereinafter stated." Except that in places which accept this act and where there is a Park Commission, that Commission shall act as a Shade Tree Commission. Section 2 provides that town commissioners or councils may, by majority vote of the former or joint resolution of the latter, accept the provisions of this act; the commissioners shall be appointed for terms of 3, 4 and 5 years respectively, and each new commissioner for 5 years (vacancies to be filled for unexpired terms only); the appointments being made by township commissioners, borough burgesses or city mayors, as the case may be. Such commission shall report its transactions and expenditures twice a year.

By Section 3 when the commissioners shall propose the setting out or planting or removing or material change of any shade-trees, they shall give a public hearing thereon, notice to be published in one or two

papers of the time and place, and exact location where trees are proposed to be placed, moved, etc. The cost of such work, of guards, curbing, etc., for tree protection, and of necessary replacing of sidewalk or pavement shall, by Section 4, "be borne by the owner of the real estate in front of which such trees are planted, set out, or removed; and the cost thereof as to each tract of real estate shall be certified by the commissioners" to the official appointing them and to the tax collector, as well as to the property owner involved. This amount becomes a lien upon the real estate charged therewith, collectible like other liens for taxes. The expense of caring for such trees and of publishing the notices above referred to are, by Section 5, to be paid from the general taxes; but such expense shall not exceed 0.1 of a mill on a dollar of assessed valuation, and may be collected as a special assessment or appropriated by township commissioners or councils; the amounts required to be certified beforehand by the Shade Tree Commission. By Section 6 the commission may employ and pay superintendents, engineers, foresters, tree-wardens or other necessary assistants; make and enforce regulations for the care of and to prevent the injury of trees on highways; may assess fines and penalties for violations of the act (which must have been published at least twice in one or two local newspapers, after having been approved by the township commissioners or councils), such to become liens on the real estate of the offenders; these fines being placed, by provision of Section 7, to the credit of the Commission, for use in the regular performance of their duties.

Life of an Electric Plant

In a paper upon "Depreciation" before the Institution of Electrical Engineers, it is suggested by Mr. Robert Hammond that "on the basis that all plant would be carefully maintained and faulty parts renewed out of revenue, the periods named below represent a fair approximation of the life of the various classes of machinery and apparatus, etc., named:

ESTIMATED YEARS OF LIFE.	
Article.	Years
Land and buildings.....	60
Machinery and plant:	
Boilers	20
Pumps and pipework.....	25
Conveyors	10
Engines	25
Turbines	20
Dynamos and alternators.....	25
Motors	20
Tools and sundries.....	10
Accumulators	15
Transformers, static	15
Converters, rotary	20
Switching apparatus and instruments.....	20
Meters	10
Mains:	
Armored	25
Solid system	30
Ducts	30

"The 'lives' set forth will doubtless provoke some criticism, but it is repeated that the 'life' largely depends upon the degree of thoroughness with which the plant is maintained."

MAINTENANCE OF WATER MAINS

Tuberculation—Chemical and Biological Deposits—Sediment—Desirability of Removing These—Method of Removal—Results Obtained in Various Cases

ONE of the subjects most freely discussed at the Toronto meeting of the American Water Works Association, and which was touched upon by several papers, was the matter of tuberculation and other stoppage of water mains, methods of cleaning them and of measuring the flow therein. Of the papers treating of these general subjects by far the most exhaustive was that of Nicholas S. Hill, Jr., of New York, entitled "Tuberculation and the Flow of Water in Pipes." In his introduction the author says: "I wonder for how long a time water works engineers and superintendents will be willing to bury their distribution systems under four feet of earth and leave them to rust, corrode, fill up and putrefy, without means of access for inspection or cleaning." He claims that the cost need not stand in the way of the remedy of these conditions, and that habit alone is to blame for them.

Discussing first the deposits, he says: "The various deposits which lessen the carrying capacity of water pipes and conduits may be divided into three classes: (1) Incrustations, commonly known as tuberculation, on unprotected or imperfectly protected iron pipes. (2) Deposits or growth on the inner surface of iron pipes whether protected or unprotected; the nature of the deposits depending upon the chemical constituents or biology of the water or both. (3) Accumulation of debris and mud in inverts, hollows and dead ends." The author does not pretend to solve the disputed question as to what tubercles are, but refers to the various chemists and others who have endeavored to determine their nature, including Dr. J. C. Brown and Mr. George C. Whipple. There seems to be little question, however, that the tubercles are dependent upon iron for their existence and do not occur where there are no points of contact between iron and water.

Among the deposits in pipes of the second class is that of a scale from hard water; but it is probable that very little of this forms except under the most unusual conditions. In the San Francisco water system "pipes which have been in use for ten or twenty-five years generally show a lime scale on the inner surface, making it somewhat rougher than the new surface of the asphalt, but no material change in the value of C has been noted as yet for the large size pipe." (LeConte.)

There are also biological causes for such deposits, one of the most serious being the ferruginous slime which is produced by the so-called iron organisms of the Crenothrix group. Various organisms produce slimes differing in firmness, some of which are easily disengaged from the pipe walls and float away in flocculent masses, in some cases entering and stopping up the service pipes, while brushes or scrapers are necessary for removing others. These deposits are sometimes black, sometimes reddish, brown or yellow, and in some cases line the pipe to the

thickness of an inch. Although these contain considerable iron this iron is not derived from the pipes, since the deposit is found also upon wood, brick and other substances. That this is not mere settling out of iron or other matters carried in suspension in the water is shown by the fact that the layer may be found as thick on the top and sides as on the bottom of the pipe. The iron apparently is drawn from the water and consequently water free from iron would not cause such deposits. Dr. Brown states that alkaline water never grows any of this slime nor does neutral water; but an appreciable quantity of iron in solution in combination with organic matter of an acid character is an invariable accompaniment. Efficient filtration removes all food of the Crenothrix and the neutralization of the acidity of the water by lime seems to introduce conditions fatal to its growth.

Pipe moss is probably more common than the iron slime. This moss is classed as an animal and attaches itself quite firmly to the pipe. Filtration is the remedy for these, since they depend for their food supply upon the algæ and protozoa. Among other animals, fresh water sponges are found in our mains and their death, which occurs when the cold weather arrives, is followed by a quick decay which is one of the principal causes for offensive tastes and odors in the water. The sponges grow from eggs and form fingers or nets reaching into and sometimes across the pipe. Mr. Emil Kuichling found, in the 36-inch Hemlock Lake conduit at Rochester, a lining one to two inches thick, resembling a dense fibrous mat which consisted largely of sponges. Many other animal forms are found in the mains, including mussels and other small shell fish, which latter have given considerable trouble by entering the intake pipes of some of the water works plants of the great lakes.

The sedimentary deposits of course occur only where the water carries matter in suspension and also where its flow is retarded in the mains to below the velocity necessary to transport the material. This matter may, of course, be clay, coal dust, semi-organic slime from swamps, etc.

It is seen that only the first of these various deposits in the pipes is due to faulty protection. All of them, except the dead sponges and some of the lighter sedimentary deposits, require something more positive than mere flushing for their removal, and some sort of scraping seems to be the only practicable method. This, however, has seen but little use in the United States, although scraping has been common in England for thirty years.

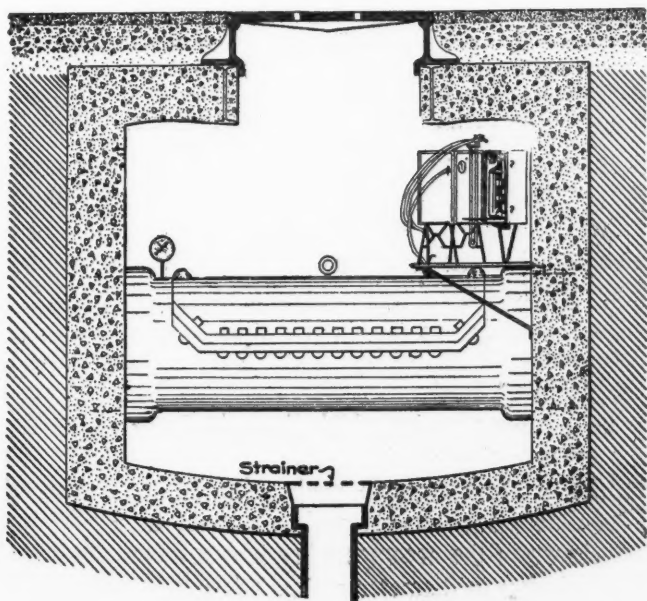
The desirability of removing these materials is twofold; first, because of the odor and taste occasioned by the death of the animal and vegetable organisms; second, because of the decrease in the carrying capacity of the

pipe. Granting a living and dying organism in a main, the probability of the first objection is apparent. The second is possibly even more serious a one, however, since it may easily reduce the capacity of the pipe by more than fifty per cent. In this paper Mr. Hill has discussed from a theoretical point of view just what this effect probably would be, quoting the formulas of Chezy, Darcy, Bazin and others. He also quotes the results of a number of investigations from which, however, he is not able to derive any definite conclusions. He then considers the desirability of spending more than is now done upon the maintenance of distribution systems, which he finds in several cities to be less than two per cent. of the total cost of repairs, and the average cost of repairs in twenty-two cities and towns he finds to be \$9.27 per mile. In view of the considerable reduction in capacity caused by the deposits before referred to, he believes that in many cases it would be cheaper to clean the old mains than to replace them with larger ones. The financial advantage of this he illustrates by the following example: "Suppose a 6-inch main to cost \$1.00 per foot and to require replacing with another main of the same size in 20 years, owing to increased consumption and the effects of tubercular deposits. Assume money to be worth 4 per cent. per annum. Then the cost of a new main at \$1.00 per foot, 20 years hence, would be equivalent to 46 cents at the present time. Assume that by proper inspection and cleaning the construction of the additional main could be delayed 10 years. The cost of a new main 30 years hence would be equivalent to 30 cents at the present time, . . . $46 - 30 = 16$ cents per foot would thus be saved, which at 4 per cent. $= .64$ cents per foot per year. Add to this the saving in interest on \$1.00 per foot for 10 years $= 4$ cents per foot per annum, and we have

$$.64 \times 20 = 12.8$$

$$4 \times 10 = 40$$

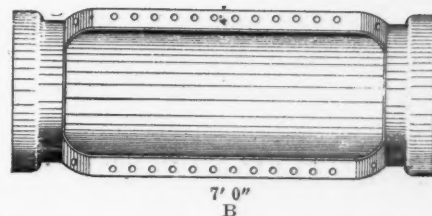
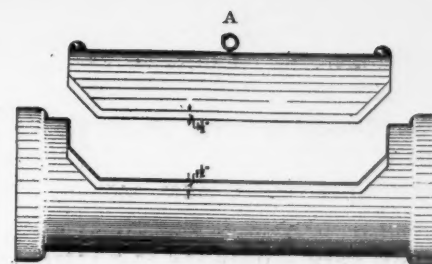
52.8 cents per foot of 6-inch main as



SECTION OF MANHOLE, SHOWING HATCH BOX, PITOMETER AND GAUGE



Section A-B.



PLAN AND ELEVATION OF HATCH BOX

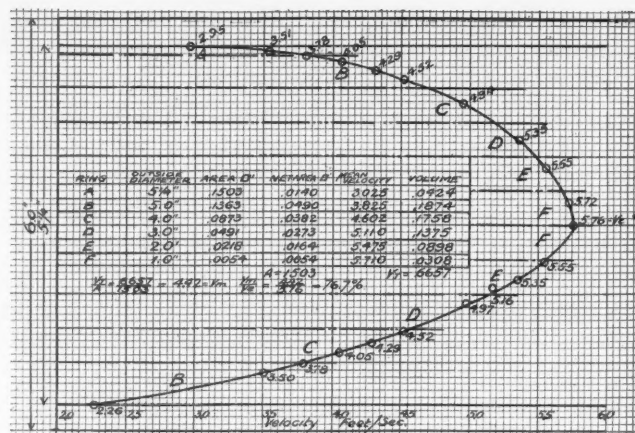
the amount we would be justified in spending in maintenance during 30 years, in addition to the present cost of repairs, which we assume to be the same, and which

averages about 17 cents per foot per year for all sizes of mains. In other words, we would be justified in spending just ten times as much for maintenance as we do at present even if all the pipes were only 6 inch. If the periods are reduced to 10 and 20 years respectively, which is more probable with heavy incrustations, then the justifiable expenditure for maintenance would be 48.8 cents per foot for 20 years and 2.42 cents per foot per annum, which would be sufficient to clean the mains once every five years. This estimate refers to the distribution system, supply mains and force mains from pumping stations would justify a much larger outlay even if the pipe were only of the same size."

To facilitate inspection and cleaning, the author proposes the introduction of manholes and hatch boxes, with pitometers, bourdon gauges and a connection with the sewer for draining the pipes, this construction having already been used by him. "An effective arrangement would be to tap ordinary 3-inch connections on either side of a gate valve located in these manholes. A small Venturi meter could be inserted at any time in this 3-inch line by means of flange connections and set up in a manhole. By closing the gate between the connection, the flow into the pipe could be by-passed and measured through the meter and the loss of head in a given section of main obtained by readings of the pressure gauges located in the various manholes. Another arrangement would be to have corporation cocks for the pitometer connections set in the gate boxes at a proper distance from the hatch boxes." These manholes would afford means for water-waste investigations; for cleaning mains where necessary; for locating leaks; for measuring water used for fires; blowing off and flushing water pipes and sewers; for determining the consumption of different classes of consumers, etc. The author estimates that with a city of 50,000 population containing 92 miles of mains, and spacing manholes every 1,200 feet at street intersections, the cost of these manholes complete would be about 15 cents per foot of main, or 8.3 per cent. of the cost of the distribution system, or an annual interest cost, at 5 per cent., of

\$3,643.20 for the entire city. In the case of a 30-inch force main in Atlanta, he finds by calculation that 36 per cent. more energy was required to pump the ordinary consumption through the uncleaned pipe than through the clean. He also gives data concerning the effect of cleaning in various cities, showing an increased discharge running as high as 280 per cent.

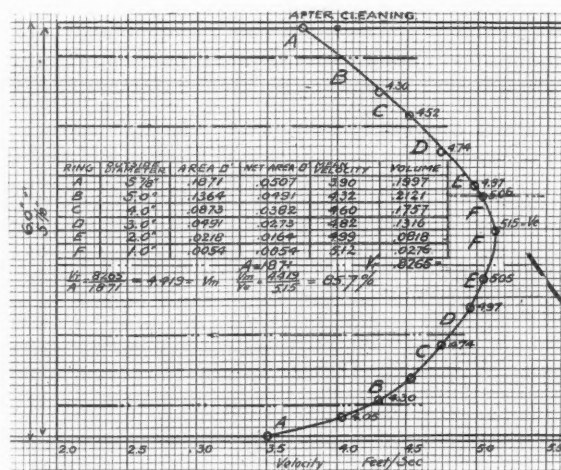
Mr. Park Woodward, in a short paper entitled "Cleaning Water Mains," described the work done in Atlanta on the 30-inch main above referred to. In order to demonstrate to the authorities what could be done two sections of 6-inch pipe were cleaned. A cut was made in one pipe connected with a 20-inch main, 220 feet from the junction therewith, under 53 pounds pressure. A 6-inch meter was put on this pipe and water turned on, and after running two minutes 270 cubic feet were registered. After the pipe was cleaned the meter was again put on and run two minutes, registering 400 cubic feet, showing an increase of 48.1 per cent. A similar test on another 6-inch main 250 feet long showed an increase of 65.2 per cent. On the satisfactory showing of these tests a contract was awarded to clean the 30-inch main. Before cleaning, the pump under a steam pressure of 110 pounds made eleven revolutions per minutes and delivered 11,880,000 gallons, while after cleaning, under the same pressure, it made 16 1-2 revolutions and delivered 17,820,000 gallons, an increase of 45.4 per cent. This enabled the department to so increase the pumping capacity as to avoid for the present the necessity of laying an additional 1,800 feet of 30-inch main, and the advisability of having the entire system cleaned is now under discussion in that city. In discussion of this paper Dr. George F. Whitney, President of the Hudson Contracting Co., described the method employed by his company in performing the work at Atlanta, as well as in other cities where equally satisfactory results are reported by the superintendents and managers. Breaks are made in the pipe several hundred feet apart, and from the down stream opening a pipe is laid to the surface of the street to carry off the water passing through the main, the valve immediately below this point being closed. A string is floated from the upper to the lower opening and by means of this a cable is drawn into the pipe, to one end of which are attached a series of appliances, generally six in number, which are then passed through the pipe partly from the pressure of the water behind and partly by the pull of the cable. The first two of these appliances are scarifiers or blades which cut into the incrustations on all sides. Following these are revolving blades which cut off the incrustations so scarified and finally come two scrapers which clean the pipe and smooth it off. Dr. Whitney claims that this machine has never broken or in any way interfered with or been seriously inconvenienced by corporation cocks protruding into the pipe. The scraping of a main in New York City gave an increase of 66 per cent. in a 6-inch pipe which had been laid in 1870; and in a 6-inch pipe in Brooklyn a 121 per cent. increase was obtained. In Jersey City an increase of 45 per cent. was obtained in a 6-inch main laid in 1856, and a 46 per cent. increase in an 8-inch main



BEFORE CLEANING

DATA

	Before cleaning.	After cleaning.
Diameter	5 1/4"	5 7/8"
Loss of head per 100 ft. length...	12"	46"
Average velocity to mean velocity	76 per cent.	86 per cent.
Mean velocity free discharge, 25 lb.	5.37 ft. per sec.	8.06 ft. per sec.
Discharge, gals. per min.....	364 by pitom.	710
Increase	by pitom.	95 per cent.
Discharge, cu. ft. per 5 min.....	2.31 by Trident meter.	448
Increase	by Trident meter.	94 per cent.
c in formula V equals $c\sqrt{r}$	47	106
n in Kutter's formula.....	.0171	.0098



VELOCITY CURVES, SHOWING EFFECT OF CLEANING 6-INCH PHILADELPHIA MAIN

in Wilmington, Del. The time required for cleaning a section of main is ordinarily from four to six hours—that is, the water must be turned off for that length of time. The entire time occupied in preparing for, as well as performing, the work, however, and in removing the apparatus, filling the hole, etc., will probably be about two days for each length of pipe. The list prices given by this company for cleaning pipes range from 26 cents per foot for 6-inch up to 80 cents per foot for 30-inch.

A much neater method of determining the effect of cleaning than by the use of the meter, as described above, is by a pitometer, by which the velocity at all parts of the cross-section of the pipe may be determined. The results of measurements made with this appliance—the Flad-Cole pitometer—in a 6-inch main in Philadelphia are shown in the accompanying illustrations. This main was 6 inches in diameter and 447 feet long and was laid in 1834. A section removed after cleaning was found by caliper to be 6 inches in diameter, although at the loca-

tion of the pitometer the diameter was but 5 7-8 inches. The data given of this experiment are based upon the latter diameter. The pitometer has been described in a recent number of the MUNICIPAL JOURNAL and it is not necessary to refer at any length to its method of operation. It is readily seen, however, how much more convenient is its use in a case of this kind than is that of a large meter, and also how much more information it gives, showing, for instance, the parts of the cross-section where the greatest increase in velocity has been produced and also the increase in diameter.

If the manholes suggested by Mr. Hill were inserted at sufficiently frequent intervals to permit of their being used for the cleaning of the mains by some such method as that used in Atlanta and the other cities referred to, it seems very probable that the cost of such cleaning could be very considerably reduced and that the mains could be inspected and cleaned at intervals of a few years or even months where conditions seem to warrant.

Automobile Fire Apparatus in Germany

HANOVER, Germany, has been using automobile fire engines, hose carts and hook and ladder carts for five years, and they have proved themselves entirely satisfactory and more economical than those drawn by horses, reports Consul-General Jay White. Most of the streets are well paved and with flat grades. This is the only city in Germany which has a complete automatic fire alarm street service, the plant having been installed by the Gamewell Fire Alarm Company, of New York. The relative costs of automobile and horse-drawn equipment at Hanover are given as follows:

	Horse-drawn (marks)	Automobile (marks)
First cost	46,500	55,000
Maintenance, first year	36,500	25,000
End of first year	83,000	80,000
Maintenance, next five years	182,500	125,000
Total	265,500	205,000

An advantage of the automobile machine is its comparative shortness, which enables it to turn sharper corners. The Hanover equipment consists of a carbonic acid machine electrically driven; a hydrant wagon electrically driven, and a steamer, steam driven.

AMERICAN WATER WORKS ASSOCIATION CONVENTION

Exhibits and Exhibitors Seen There—Fifty-five Manufacturing and Other Companies Represented

A GENERAL description of this convention was given in the News of the Societies in last week's MUNICIPAL JOURNAL AND ENGINEER; and following this article we reproduce a photograph of the members, from which, however, a number of faces of those attending the convention are unfortunately missing. In another column we abstract a few of the papers which were read there, and we expect to present in the next few numbers some of the more important points contained in others. One of the most interested of the Active Members present was Mr.

S. Inoue, of Kyoto, Japan, of which municipality he is Chief Engineer, and which has sent him abroad to add whatever he can to his knowledge of municipal utilities.

Not the least important part of this convention was that contributed by the Associate Members, of which there were about 115 present; and the exhibits made by these were of great interest and information to the Active Members. Unfortunately, the railroads and the custom house were responsible for considerable delay in the receipt of most of the exhibits; in fact, some did not reach there at all during the convention, but the representatives of the various business houses did their best to atone for this by their personal efforts.

The Neptune Meter Company, of 90 West street, New York City, was represented by J. L. Wertz, Vice-President; Fred A. Smith, General Eastern Manager; H. I. Brown, Western Manager; C. S. Brown, Charles Stewart, T. D. Faulks, D. F. McCarthy, Hugh Doran, Henry Dill, W. L. Dillon, C. A. Vaughan and F. W. Haultz. They had a very fine exhibit of trident, single speed and their other makes of meters.

The Thomson Meter Company, of 79 Washington street, Brooklyn, N. Y., was represented by W. S. Citti, E. M. Shedd and H. J. Putnam. They exhibited a full line of Lambert meters.

The National Meter Company was represented by John C. Kelly, Jr., of the New York office; W. E. Cox, W. P. Oliver, Matt Wammack, H. L. Weston, Lewis H. Nash, David B. Leck, D. H. Buell C. S. Francis, N. W. Tucks, F. B. Bradley, P. J. Voss. They had on exhibition a number of their Standard Crown Meters.

The Buffalo Meter Company, of 290 Terrace, Buffalo, N. Y., was represented by G. B. Bassett, President, and W. J. Schillew. They exhibited a full line of Niagara and American Water Meters.

The Union Water Meter Company, of Worcester, Mass., was represented by G. P. Anderson, M. F. Ruge, Frank L. Northrop, Frank E. Hall, A. S. Otis and Edward B. King. Their exhibit contained a number of their make of water meters.

The Pittsburg Meter Company, of East Pittsburg, Pa., were represented by T. C. Clifford, general agent; H. I. Miller, V. E. Arnold, A. D. Hays and J. H. Davis. They had on exhibition their Keystone Water Meters and also a new Eureka Current Water Meter designed especially for elevators, street sprinkling carts, stand pipe and fire service.

The Hersey Manufacturing Company, of Boston, Mass., was represented by J. A. Tilden, General Manager; F. C. Hersey, of the Boston office; W. T. Sherwood, of the New York office; L. S. Barnard, of the Buffalo office; A. H. McAlpin and E. T. Mull, of the Columbus office; H. C. Irwin, Jr., of the Atlanta, Ga., office, and H. C. Ennis, Jr. They exhibited a full line of Hersey Meters in a handsome cabinet, lighted by electricity; also a detector meter.

The Henry R. Worthington Company, of New York, was represented by George H. Carr and M. A. Allen; also by Ed. Saumberger, of the Snow Steam Pump Works, and Mr. Deckrow, of the Holly Steam Pump Company. They had on exhibition a number of their different makes of water meters and also photographs of pumps and machinery.

The Ross Valve Manufacturing Company, of Troy, N. Y., was represented by William Ross, the General Manager. They exhibited a feed water filter, a pressure regulating valve and a hydraulic pump designed for blowing church organs.

The Canadian Fairbanks Company was represented by F. M. Allen, Manager. A considerable assortment of valves, fire hydrants, etc., was included in their exhibit.

The Ludlow Valve Manufacturing Company, of Troy, N. Y., was represented by James H. Caldwell, Vice-President and General Manager. The company is said to be the oldest and largest in the world which manufactures gate valves. Mr. Caldwell gave as a souvenir a leather cigar case.

The Coffin Valve Company, of Dorchester, Mass., was represented by F. E. Adams. They exhibited a working model of a 36-inch electric valve operated from a lamp socket, especially designed for control from a considerable distance; also a working model of a Coffin Patent Sluice Gate and Coffin Gate Valves and Fire Hydrants.

The Builders' Iron Foundry, Providence, R. I., was represented by E. C. Atkins, and exhibited blue prints and diagrams showing operation of the Venturi meter. Mr. Atkins also gave a practical demonstration of this meter.

Mr. Charles H. White, from the New York office of the Fairbanks Company, entertained a party of forty-five guests at the

plant of the Ontario Power Company at Niagara Falls. The party inspected the largest valve in the world, which was installed in this plant by the Fairbanks Company.

The Eddy Valve Company, of Troy, N. Y., was represented by F. S. Robinson.

The Chapman Valve Company, of Indian Orchard, Mass., was represented by Herbert E. Stone and Edward F. Hughes.

The H. Mueller Manufacturing Company, of Decatur, Ill., and New York City, was represented by Henry Mueller, of Decatur, and Fred B. Mueller and Oscar Mueller, of New York; Robert M. Hastings, of the Buffalo office, and Horace F. Clark, of Grand Rapids. In their exhibit was included pipe tapping machines; also a complete assortment of brass water works and plumbers' goods. As a souvenir they gave forged steel nickel plated pliers to the gentlemen and playing cards to the ladies.

The Ellis Ford Manufacturing Company, of Detroit, Mich., was represented by John J. Hurley, Vice-President. Three sizes of pipe cutters for both cast and wrought iron were shown by them; a chain pipe vice holding pipe from $\frac{3}{8}$ -inch to 6-inch diameter and another holding 4 to 12-inch pipe; a testing plug for testing water mains under pressure; also a flush tank meter designed for accurately adjusting the flow to such tanks.

The A. P. Smith Company, of Newark, N. J., was represented by T. F. Halpin, Secretary; D. F. O'Brien and Fred M. Whitcomb. Their exhibition consisted of water works and plumbing supplies, pipe cutters, etc.

James Morrison Brass Manufacturing Company, of Toronto, Canada, was represented by Robert A. Morrison, C. E. Morrison, Secretary and Treasurer; Arthur Betton, Eastern Representative, and Charles M. B. World, of the Toronto office, and D. T. Hadley. Their exhibition contained a full line of curb and main cocks, water works valves, gauges, clocks and revolution counters.

Chicago Brass and Iron Company was represented by E. G. Dadd.

The Glauber Brass Manufacturing Company, of Cleveland, Ohio, was represented by I. Herzbrum, as special representative and J. L. Goodman. They exhibited water works brass goods, including inverted-key curb-stops and wastes, a complete line of T-handle corporation stop-cocks for all kinds of tapping machines; plumbers brass goods, consisting of compression and fuller work; also gas and meter cocks.

The United Brass Manufacturing Company, of Cleveland, Ohio, was represented by William J. Schoenberger, S. P. Schoenberger and T. V. Dailey. They exhibited a wipe joint machine, which joints lead to lead or brass to lead, and gave practical demonstrations of its working, and tested the joints at 1,000 pounds hydraulic pressure made at Toronto. They also exhibited curb, corporation, stop and waste cocks, and a full line of water works brass goods.

The Lunkenheimer Company, of Cincinnati, was represented by J. F. Carlind.

The Hayes Manufacturing Company, of Erie, Pa., was represented by T. J. Nagle and R. C. French. They exhibited water works supplies, McNamara's hydrant and extension service boxes. They distributed a picture as a souvenir.

Modern Iron Works, of Quincy, Ill., represented by George J. Fisher, exhibited a line of service boxes and also a line of their new Quinsee service box, also the Peerless and the old style Buffalo box.

Mr. H. W. Clark of Mattoon, Ill., illustrated the Clark meter box.

The American Steam Gauge and Valve Manufacturing Company, of Boston, Mass., was represented by C. H. Mosher. They

exhibited the Sanborn nozzle piezometer; also recording gauges and records.

The Clark and Cowles Valve Co., 135 Broadway, New York City, was represented by H. A. Wilson, Secretary; F. S. Seagrave and W. H. Drew. They exhibited Seagrave hydrant cut-off valves, of which a practical demonstration was given on a Toronto hydrant near the City Hall.

The Lead Lined Iron Pipe Company, of Wakefield, Mass., represented by Thomas E. Dwyer, Manager, exhibited lead lined pipe and specialties.

The Canco Manufacturing Company, of Philadelphia, represented by George M. Costello, President; L. H. Carnfel, of the Boston office, and W. E. Gillman, of the Toronto office, exhibited high and low pressure Black Squadron water packing, which packing is used, they stated, in the pumps of the Toronto water works.

The L. M. Booth Company, 136 Liberty street, New York, represented by L. M. Booth, President, exhibited catalogues setting forth the claims of the Kennicutt Water Softener Company, of Chicago. Mr. Booth gave a key purse as a souvenir.

The Pittsburg Filter Manufacturing Company, Pittsburg, Pa., was represented by F. B. Leopold, General Manager; G. S. Allman, and Baldwin Springer.

The Dearborn Drug Chemical Company, Chicago, Ill., was represented by Jos. N. Gregory, Manager of the Buffalo office.

The Davis Supply Company, of Chicago, represented by H. R. Marshall, gave an exhibition of gas-creating furnaces, gas fitters' tool-carts and patent pipe-jointers.

The Central Foundry Company, 37 Wall street, New York, was represented by C. F. Blount. They exhibited universal pipe, which has a machined tapered joint, requiring no lead or packing.

The Wyckoff Supply Company, Elmira, N. Y., represented by F. V. Wyckoff, President, exhibited a 6-inch wood pipe which was installed on East Church street, Elmira, N. Y., by General Diven, father of the present Secretary of the Water Works Association, in 1865. After having been under 80 pounds pressure, it was, in March, 1907, removed, and the sample showed wood, bands and asphalt coating in an excellent condition.

The Carnahan Sherwood Co., of Indianapolis, Ind., represented by H. E. North, Sales Manager, exhibited a self-balancing system for water works, gas and electric light accounting.

The National Water Main Cleaning Company, of 27 William street, New York, represented by Dr. George F. Whitney, President; Daniel H. Buel and A. P. Foster, exhibited short sections of water pipes, both covered with tubercles and after cleaning by their apparatus. They also exhibited a section of wood pipe laid by Aaron Burr at the present site of the Manhattan Bank of New York.

The Pitometer Company, of New York and Chicago, represented by Edward Cole, New York Manager; George R. Bascom and C. B. Suttle, exhibited pitometers, recorders and pump slip indicators. They also gave a display of pictures of water works plants where these devices have been used.

The Chicago Bridge and Iron Company, Chicago, Ill., represented by George F. Horton, General Manager, and E. G. Ladd, the head of the sales department, exhibited photographs and blueprints of elevated tanks, including one of the largest water tower ever built, erected at Louisville, Ky., for the Louisville Water Company.

The United Lead Company, of 100 William street, New York, exhibited some lead wool, used for calking joints of cast-iron pipe.

The Epping Carpenter Co., of Pittsburg, Pa., was represented by J. N. Chester and F. F. Woods.

J. T. Ryerson & Son., of Chicago, was represented by J. T. Corbett.

The American Steel and Wire Company, of Chicago, was represented by A. T. Weaver.

The American Pipe Works, of Philadelphia, was represented by Paul A. Ivy.

The Drummond McCall Co., of Toronto, was represented by H. J. Hamilton.

The Adjustable Clip Co., of Columbus, O., was represented by F. E. Stevens.

The Kerr Engine Company, of Walkerville, Ont., was represented by H. O. Kerr.

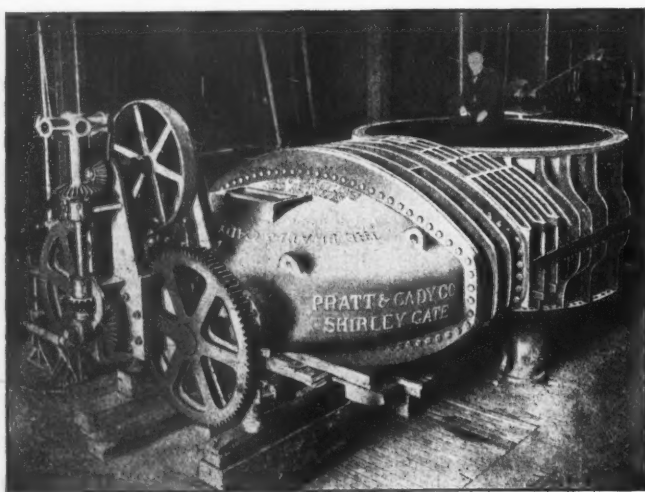
The Allis-Chalmers Co., of Milwaukee, Wis., was represented by J. J. Lynch.

The Waterworks Equipment Company, of New York City, was represented by W. H. Van Winkle and W. H. Van Winkle, Jr.

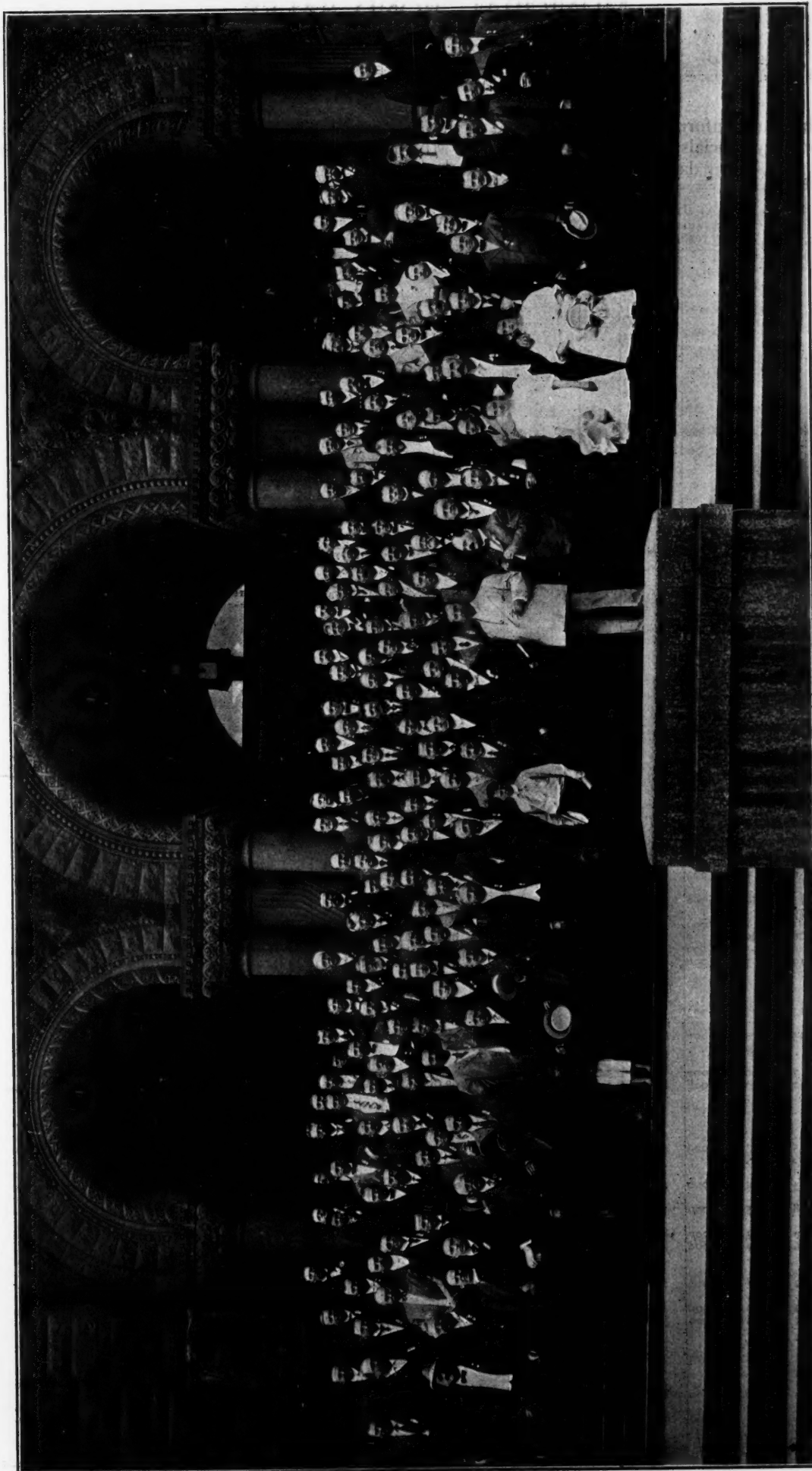
The United States Cast Iron Pipe and Foundry Company, of New York City, was represented by Thomas H. McGlechin, New York; E. P. Koetten and T. N. Johnson.

The Rensselaer Manufacturing Company, of Troy, N. Y., was represented by Fred S. Bates, John S. Warde, Jr., George M. Keefer and O. Jovet.

R. D. Wood and Company, of Philadelphia, was represented by E. J. Came.



SAID TO BE THE LARGEST GATE VALVE IN THE WORLD



MEMBERS OF THE AMERICAN WATER WORKS ASSOCIATION, IN CONVENTION AT TORONTO, CANADA

TAKEN JUNE 19, 1907, ON THE STEPS OF THE MUNICIPAL BUILDING

MUNICIPAL BOND SALES

Data Concerning Sales of Municipal Bonds During May by Cities of Less than 100,000 Population—
Financial Statistics of Cities Listed

Believing that such information as is contained in the following table is of interest and value to Mayors, Comptrollers and other city officials, it is the intention of the MUNICIPAL JOURNAL AND ENGINEER to publish, in the first issue of each month, similar data covering the successive months.

NAME OF CITY	Estimated Population	ACTUAL VALUE OF ASSESSABLE PROPERTY (estimated)		Ratio of assessed to actual value	Bonded Debt	Sinking Fund	NET BONDED DEBT		Tax Rate per \$1,000 Ass'd Value	BOND SALES, MAY, 1907				Basis
		Total	Per Capita				Total	Per Capita		Term of Years	Amount	Interest	Price	
Jonesboro, Ark.	10,000	\$6,000,000	\$600	40%	\$275,000		\$275,000	\$27.50	\$5.00	20	\$55,000	5%	\$95.00	\$5.411
Glendale, Cal.										1-40 ser.	5,000	6% s.a.	120.94	4.434
Monrovia, Cal.	4,000	10,000,000	2,500	33%	12,500		12,500	3.12	15.00	1-20 ser.	25,000	5% s.a.	110.60	3.768
Santa Clara, Cal.										1-40 ser.	60,000	3 1/2% s.a.	104.028	4.251
Waterbury, Conn.	64,000									20	200,000	4% s.a.	101.77	3.872
Decatur, Ill.	30,000	20,000,000	667	20%	135,800	\$10,300	125,500	4.18	26.90	20	125,000	5%	Par.	
Joliet, Ill.										10	51,000	4 1/2% s.a.	103.279	4.096
Decatur, Ind.										4 avg.	6,500	4%	100.493	3.866
Des Moines, Ia.										1 1/2 avg.	78,000	4 1/2% s.a.	104.178	4.159
Herington, Kan.										20	43,000	5% s.a.	Par.	
Winfield, Kan.	8,094	4,900,000	605	22%	273,000	3,569	269,431	33.29	7.92	10-30 opt.	40,000	5%	100.50	4.935
Hagerstown, Md.										1-10 ser.	4,000	5 1/2%	Par.	
Chicopee, Mass.	20,600									1 1/2 avg.	5,000	4 1/2% s.a.	100.11	3.989
New Bedford, Mass.	80,000									1-28 ser.	56,000	4%	101.00	3.909
Palmer, Mass.										20	20,000	4%	100.97	3.939
Quincy, Mass.	30,000									1-10 ser.	30,000	4 1/2%	100.66	4.363
										5 1/2 avg.	41,000	4% s.a.	100.079	3.991
										1-40 ser.	40,000	4% s.a.		
										1-3 ser.	6,000	4% s.a.		
										10 1/2 avg.	50,000	4%		
Watertown, Mass.	12,000									1-12 ser.	24,000	4%	100.036	3.994
										6 avg.	5,000	4%		
										1 1/2 avg.	7,500	4%		
Flint, Mich.	16,000									16 1/2 avg.	100,000	4 1/2% s.a.	101.411	4.13
Pontiac, Mich.	12,000	8,000,000	667	75%	223,000	6,417	216,583	18.05	21.00	1-10 ser.	10,000	5% s.a.	103.11	4.358
Aitkin, Minn.										5-14 ser.	30,000	4%	Par.	
Bimidi, Minn.										15 avg.	35,000	5% s.a.	103.714	4.653
Dawson, Minn.										20	28,000	5% s.a.	104.553	4.647
Henderson, Minn.										10	10,000	5%	103.10	4.608
Kelliher, Minn.										5-9 ser.	5,000	6%	Par.	
St. James, Minn.										4 5/6 avg.	6,500	5% s.a.	100.384	4.91
Edwards, Miss.										10-20 opt.	20,000	6% s.a.	100.55	5.927
Newton, Miss.										1-20 ser.	40,000	6%	100.50	5.936
Moberly, Mo.										5-20 opt.	15,000	5% s.a.	101.716	4.612
Norfolk, Neb.										20-30 opt.	24,000	4 1/2%	101.42	4.392
Lakewood, N. J.										1-15 ser.	15,000	5% s.a.	104.50	4.328
Weehawken, N. J.										30	43,000	4 1/2 s.a.	102.07	4.375
										10	32,000	4 1/2 s.a.	100.72	4.491
Bronxville, N. Y.	1,300	1,834,000	1,411	100%	64,000	None.	64,000	49.23	15.00	5-7 ser.	1,500	4 1/2%	Par.	
Charlotte, N. Y.										1-16 ser.	8,000	4 1/2%	100.377	4.56
Greece, N. Y.										1-10 ser.	10,000	4 1/2%		
										1-10 ser.	5,000	4 1/2% s.a.		
										10-30 ser.	21,000	4 1/2% s.a.		
Hoosic Falls, N. Y.	6,000									3-27 ser.	75,000	4 3/4%	100.091	4.291
Huntington, N. Y.										5-14 ser.	12,500	4 1/2%	Par.	
Lestershire, N. Y.										4-20 ser.	8,500	4 1/2%	100.289	4.468
Malone, N. Y.	6,500	5,000,000	769	60%	225,000	None.	225,000	34.61	10.00	3	225,000	4 1/2%	100.088	4.719
Oyster Bay, N. Y.	3,000									1-15 ser.	15,000	5% s.a.	102.015	4.694
Schenectady, N. Y.	75,000	50,000,000	667	70%	2,663,000	302,920	2,360,080	31.47	18.40	20	400,000	4 1/2 s.a.	105.179	4.117
Troy, N. Y.	76,800									6 mos.	100,000	4%	Par.	
Waterville, N. Y.	1,700	1,000,000	588	75%	60,000		60,000	35.30	9.00	14 avg.	30,000	4 3/4%	100.116	4.339
Yonkers, N. Y.	68,000	60,019,750	882.64		5,018,682	299,600	4,719,082	69.40	24.48 1/2	16 avg.	17,000	4 1/2%	102.91	4.247
Athens, O.	6,000	5,600,000	933.33	1/4	200,500	13,711	186,789	31.13	40.30	1-10 ser.	4,000	5% s.a.	103.35	4.248
Barberton, O.	10,000	5,600,000	560	50%	158,544	422	158,122	15.81	3.14	5 1/2 avg.	10,555	5% s.a.	103.709	4.202
Caldwell, O.										1-10 ser.	11,000	5%	103.522	4.275
Chagrin Falls, O.										1-10 ser.	26,850	4 1/2% s.a.	101.792	4.10
Defiance, O.										4 avg.	20,000	4 1/2% s.a.	101.532	4.08
Delaware, O.	11,000	7,000,000	636	.56	214,584	14,365	200,219	18.20	31.70	1-10 ser.	4,000	5% s.a.	104.28	4.122
Elyria, O.	15,000	13,000,000	867	.33 1/2	866,100	70,000	796,100	53.07	38.30	12-16 ser.	25,000	4 1/2% s.a.	103.35	3.706
										3-5 ser.	25,000	4 1/2% s.a.	101.204	4.173
										2-6 ser.	20,000	4 1/2% s.a.	101.115	4.198
Fremont, O.										1-10 ser.	1,845	4 1/2% s.a.	102.384	4.013
Greenville, O.	7,850	6,500,000	828	50%	148,000	30,000	118,000	15.03	2.90	5 1/2 avg.	36,757	4%	100.03	3.993
Hamilton, O.	30,000	22,000,000	733.33	112	1,064,505	54,684	1,009,821	33.66		15	16,000	4 1/2% s.a.	102.228	3.803
Killbuck, O.										1-30 ser.	900	6%	103.02	5.709
Medina, O.										18 1/2 avg.	32,000	4 1/2% s.a.	100.25	3.98
Miamisburg, O.										1-13 ser.	13,000	4 1/2% s.a.	100.077	3.987
Morrow, O.										10	3,000	5%	105.383	4.334
Napoleon, O.	5,000	3,000,000	600	113	186,890		186,890	37.38	47.20	1-5 ser.	5,970	5% s.a.	101.776	4.362
St. Bernard, O.										30	6,500	4%	103.792	3.782
Sandusky, O.	23,000	14,000,000	608	.50	640,000	10,000	630,000	27.39	16.92	1-10 ser.	1,863	4 1/2% s.a.	101.878	3.62
Springfield, O.	48,000	35,000,000	729.17	3/5	1,014,827		1,014,827	21.14	27.30	1-7 ser.	35,000	4 1/2% s.a.	100.392	3.894
										15	26,000	4 1/2% s.a.	101.442	3.872
Washington C. H., O.	0,000	7,200,000	800	33%	66,555	62,355	4,200	0.47	31.80	1-10 ser.	3,405	5% s.a.	101.468	4.694
La Grande, Ore.	6,000	2,500,000	417	40%	75,000	None.	75,000	12.50	12.00	1-10 ser.	9,481	5% s.a.	102.109	4.48
Chester, Pa.										1-30 ser.	15,000	4 1/2% s.a.	101.506	3.87
Ellwood City, Pa.										10-20 opt.	160,000	5% s.a.	Par.	
Sayre, Pa.	10,000	7,000,000	700	33%	25,000	None.	25,000	2.50	9.00	10-20 opt.	200,000	4%	Par.	
Chattanooga, Tenn.										10 1/2 avg.	20,000	4 1/2% s.a.	Par.	
Clarksville, Tenn.	12,000	5,250,000	438	75%	308,500	4,500	304,000	25.33	12.50	5-20 opt.	1065,000	4 1/2% s.a.	100.515	4.468
Jackson, Tenn.	20,000	6,500,000	325	50%	361,000	48,000	313,000	15.65	2.99	20	25,000	4 1/2% s.a.	97.60	4.608
St. Elmo, Tenn.										20	125,000	4 1/2% s.a.	Par.	
Greenville, Tex.										18,000	5 1/2% s.a.	103.00	5.257	
Marlin, Tex.	5,000	3,000,000	600	60%	58,500	3,852	54,648	10.93	11.50	1-40 ser.	40,000	4 1/2%	100.50	4.462
Nacogdoches, Tex.										5-40 opt.	16,000	4 1/2% s.a.	Par.	
Waco, Tex.										40	50,000	5%	103.10	4.824
Walla Walla, Wash.	20,000	16,837,000	842	60%	653,700		653,700	32.68	15.00	30	60,000	5% s.a.	108.258	4.496
Juneau, Wis.										20	100,000	4 1/2%	101.425	4.392
La Crosse, Wis.	20,000	19,800,000	683	95%	732,000	175,079	556,921	19.20	18.00	1 1/2 avg.	10,000	5% s.a.	103.00	4.708
Tomahawk, Wis.										9 1/2-19 1/2 opt.	20,000	4 1/2% s.a.	99.25	4.10
Waukesha, Wis.	7,000	4,000,000	571	55%	159,000	10,500	148,500	21.21	19.47	11 1/2 avg.	40,000	5% s.a.	103.125	
											70,000	4 1/2% s.a.	Par.	

THE DISPOSAL OF MUNICIPAL WASTE

Systems and Methods, with Special Reference to American Conditions—Inventions and Patents of S. G. Brown, Alex Brownlee, H. B. Smith, M. V. Smith, A. Vivarttas and Others—Descriptions and Illustrations

By W. F. MORSE, Sanitary Engineer

This Series of articles, begun in the February, 1906, number, will be continued until completed and will be illustrated by original drawings, cuts, diagrams and pictures, and contain many tables valuable for reference.

The Subjects Already Treated by the Author Are:—

1. The Waste Collection Service in American Towns; Methods and Results.
2. Definition of Terms; Quantities; Proportions; Character of Waste in General.
3. Garbage; Analysis; Proportions; Values.
4. Dry Refuse and Rubbish; Quantities and Treatment.
5. Classification:—Commercial Values after Recovery.
6. The Refuse Utilization Stations in New York, Boston, Buffalo, and Brooklyn (illustrated).
7. Municipal Ashes; Analysis; Proportions; Values when Separated.
8. Ashes from Cremation of Garbage; Analysis and Values; Comparative Table.
9. Comparison of Ashes from English and American Cities; Cremation Means.
10. The Utilization of Municipal Waste in General; English and American Methods.
11. Commercial Values of Refuse and Ashes when Marketed and Manufactured.
12. The Analysis of Garbage; Tankage; Its Value (Special Tables).
13. The Garbage Disposal Plant, Cleveland, Ohio.
14. Street Sweepings; Fertilizing Value and Treatment.
15. Comparative Commercial Values of Waste.
16. Foreign Destructor; Special Chapter by an Eminent Authority.
17. The First Garbage Cremators.
18. Official Reports on Cremators.
19. Chronological List of American Crematories from 1885.
20. List of Government and Institutional Installations.
21. Consolidated Tables of Installations; Hygiene and Sanitation.
22. Types of Furnace; the Operating American Furnaces (fully illustrated). Continued.

The Following Are to Appear:—

23. Calorific Value of Waste as Fuel (Comparative Table).
24. Reduction and Extraction Process Described and Illustrated; the Earlier and Later Methods.
25. American Methods; Col. Waring and His Successors.
26. Present Situation in This Country; Résumé.
27. Means for Improvement as Suggested by Several Investigators.
28. What May Be Expected of the Future.

The American Garbage Cremator Co. and Mr. Samuel G. Brown, Boston

EARLY in 1893 the City Council of Boston appointed a committee to examine into the subject of garbage disposal with instructions to report upon the methods in use elsewhere and their adaptability for that city. This committee held meetings at which several of the representatives of reduction and cremation companies were present, and described their systems and apparatus. Afterwards the committee made an extensive tour for the inspection of these methods as employed in other cities.

For the purpose of demonstrating the efficiency of the furnace of the American Garbage Cremator Co., of Boston, Mr. S. G. Brown designed and erected an experimental plant upon the city's ground at Albany street, which was operated for some time in March and April, 1893.

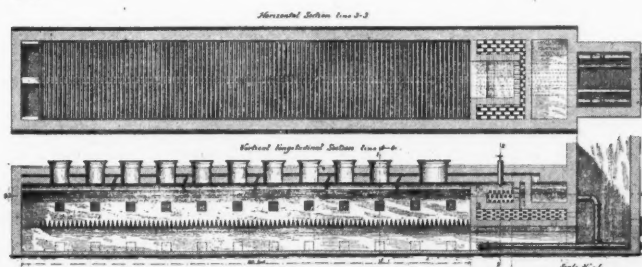


FIG. 59. THE BROWN REGENERATIVE GARBAGE FURNACE

The Brown Cremator, Fig. 59, was 28½ feet long, 9 feet wide and 6½ feet high. The exterior casing, of steel plates, was bound together with buckstays and tie rods. The interior was lined with fire brick with a flat arched roof of two parallel arches of fire brick with air space. The furnace was divided by a longitudinal horizontal iron grate, the bars of which were A-shaped, hollow, triangular sections 10 inches high. The hollow spaces of these bars were filled with a refractory metallic composition, the secret of the inventor. Below this grate a longitudinal bridge wall divided the lower compartment into two equal chambers, or long flues, which connected with the chimney.

At the rear end, on the same plane with the grates, was a brick chamber that contained the oil burner for generating heat. This burner consisted of three concentric pipes, the innermost, of small dimensions, carrying steam; the second conveying the oil, and the third larger outer one containing hot gases drawn from the lower heated flues of the chimney.

The simultaneous discharge from these pipes converted the oil to gas, and, mixing this with the hot gases from the flues, formed a new combustible gas, which was assisted by transverse currents of heated air from the air spaces of the roof and sides of the furnace.

By the force of the blast, this was driven over a transverse bridge wall onto the garbage piled upon the grates, and, passing the length of the furnace, was returned through the lower flues to the chimney. The blast was maintained by a blower driven by a separate small steam boiler fired with coal.

The operation of this furnace—the first to attempt the destruction of garbage by liquid fuel—attracted attention, and was tested by the City Engineers, and temperatures were recorded by Professors Holman and Wendell, of the Massachusetts Institute of Technology.

At the final trial, April 25, 1893, the following reports were tabulated by the city authorities:

TEST OF BROWN'S CREMATOR, BOSTON, APRIL 25, 1893

Time occupied	10 hours
Garbage consumed	19 1-2 tons
Garbage consumed per hour	1.95 tons
Area of garbage grates .....	.60 square feet
Quantity consumed per square foot grate per hour .....	.65 pounds
Oil consumed, 10 hours	323 gallons
Oil consumed per hour	32.3 gallons
Coal used in steam boiler	400 pounds
Labor (1 engineer, 1 stoker, 2 laborers), per hour	\$1.00
Total cost per hour, labor and fuel	\$2.39
Cost per ton garbage consumed	\$1.22
Weight of ash residuum	1085 pounds
Weight of ash per ton garbage	55 pounds
Temperature near bridge wall, first trial	2580° Fah.
Temperature near bridge wall, second trial	2460° Fah.
Temperature outer end of furnace	1850° Fah.
Temperature opening in top of furnace	1760° Fah.
Temperature flue gases	1680° Fah.

So far as known this was the only official report of garbage disposal by liquid fuels where the temperatures were accurately recorded. The operation of the furnace was at a higher cost than similar work at the Chicago Exposition by an Engle Cremator, where the expense for labor and fuel was 63 cents per ton.

The Brown Cremator was built at Wilmington, Del. (1894), with the double exterior water-jacket casing, the first recorded instance of this form in American practice.

Because of the expense of operation, using oil as fuel, this crematory was discontinued in 1897. The Brown cremator was built at Troy, N. Y., and Washington, D. C., but all are now discontinued. Petroleum is an ideal fuel for garbage disposal work, but too expensive for use unless at the points where the oil is procured direct from the ground.

In 1900, Mr. Brown took out patents for a cremator of nearly similar construction, using coal as fuel, but there are no records of installations in this form. The American Garbage Cremator Co. did not continue the Brown furnaces after the Washington, D. C., installation.

The Brownlee Garbage Furnace

In 1891, Mr. Alex. Brownlee, of Dallas, Tex., formerly a representative of the Engle Company, procured a patent, No. 448,115, for a garbage furnace, under which he built several furnaces in Texas. Subsequently, in 1895, he took out another patent for an improved form of this crematory, the chief installation being at New Brighton, Staten Island, N. Y.

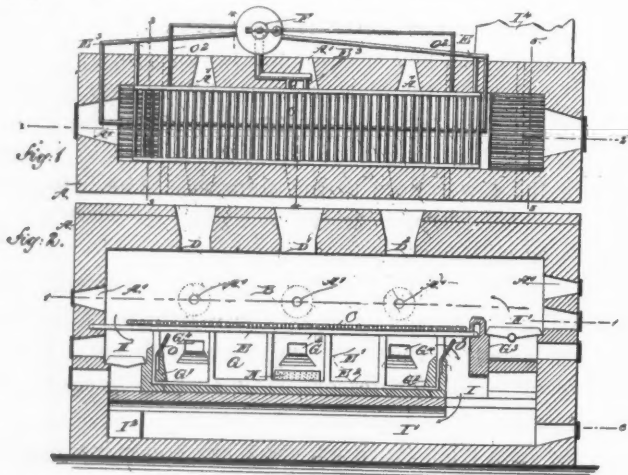


FIG. 60. PLAN AND SECTION OF BROWNLEE GARBAGE FURNACE

This furnace, Fig. 60, follows closely the form and construction of the Engle cremator, being almost exactly identical in exterior dimensions and differing slightly in interior arrangement. There is the large upper combustion chamber (B), charged through circular opening in the roof (D), the transverse longitudinal garbage grates (C), and the fireboxes (H) at each end of the grates. Below the grates is an enclosed pit (G), filled for half its depth with sand to catch and retain the liquids dripping through the garbage grate, and provided with drainage pipes.

Below this sand box is a lower flue (I), at the end of which is the passage to the chimney (I²). The third fire

for consuming the gases is at some point in this flue or outside at the chimney connection.

The grate bars (C) are hollow iron pipes, supported in their middle line by a larger pipe, the whole system of piping being connected with an exterior tank or boiler (F), which provides for a continuous water circulation through all the grates exposed to the fire.

The flames and heat from the main firebox (H¹) pass over the garbage, are reinforced at the second firebox (H²), and pass under the grates and over the sand pit, thence through the opening (I) to the flues (I¹), and over the third firebox to the chimney. The usual doors for stoking and ash removal are provided.

In practical operation of this crematory it was found hard to secure the passage of the smoke through the tortuous flues to the chimney, and still more difficult to obtain the temperature for perfect combustion because of the loss of heat taken up by the water grates. In one instance the furnace was discontinued by legal proceedings because of nuisance from the stack caused by incomplete combustion. There is now but one example of the Brownlee crematory operating, and this has been radically changed in construction from the plans and inventions of the original builders.

The Bridgeport Boiler Works, and Mr. H. B. Smith of Bridgeport, Conn.

This invention is another example of a garbage furnace with water grates for receiving the garbage and of alternate action in passing the heat from one to the other of the chambers. The crematory was first built at Waterbury, Conn., in 1901, and has been intermittently used since then. The largest installation made by the Bridgeport Boiler Works, who were the builders under the patents of Mr. H. B. Smith, was at Newport News, Va., in 1902.

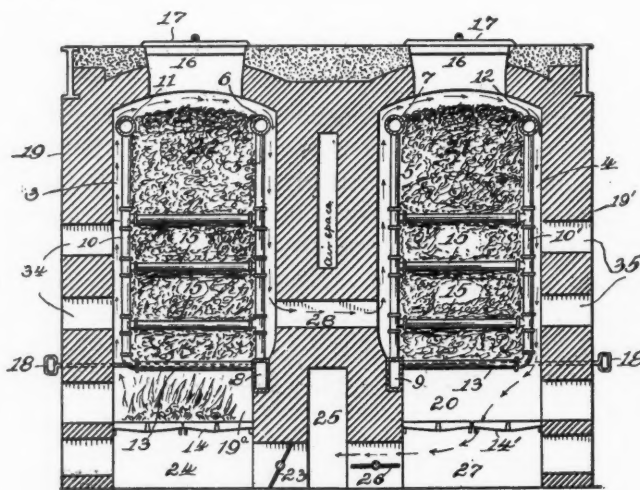


FIG. 61. H. B. SMITH GARBAGE CREMATOR

The crematory (Fig. 61) comprises two separate chambers, connected by a flue or opening for the passage of the gases, from one to the other alternately. In each chamber is suspended a cage or basket made of hollow iron piping, with larger pipes at the top and bottom. This basket receives the garbage through circular opening in the roof.

The cages are set away from the walls to form a passage to permit the passage of the flames around and over the cages and their charges of garbage, and their final exit through the opening (26) into the second chamber, where, after passing around and over the baskets, the gases descend through the second firebox (20) to the lower flue (26) to the chimney. The pipes of each set of baskets are connected with headers and these with a water tank or exterior boiler, which maintains a circulation of water through the system of piping. There are provided doors (35) for stoking or stirring the garbage, and a series of iron rods (18) between the lower tier of garbage pipes, which may be withdrawn, permitting the dried charge of garbage to fall into the firebox (13) and be consumed.

The theory of this furnace is the alternate firing of the chambers, the heating and drying of the charge of garbage by the iron pipes of the basket, and the combustion of the waste without the need of a secondary stench-cremating fire.

The installation at Newport News did not fulfill the conditions of the contract and was not accepted by the city. No other examples of the H. B. Smith furnace, except at Waterbury and Newport News, have been built.

Water Grates

In addition to the furnaces already described (Decarie, Branch, Brown, Brownlee and Smith), there are some seven or eight others which include water bars as an important part of the construction. These are mostly examples of patents, only one or two having reached the stage of experimental construction. In the order of patents they are:

E. G. Teed.....	377,651, etc., four patents
A. G. Delanoy.....	479,405, etc., three patents
McKay & Delanoy.....	517,288
A. W. Colwell.....	583,566
M. K. Stringfellow.....	583,663
F. G. Wiselogle.....	803,650
G. Thunn.....	807,219

Besides those named, six or seven other inventions have been brought out for small water heaters and refuse consumers, using this principle of water grates. For the disposal of small amounts of dry combustible refuse this form of small furnace is used in many installations, but they are not so successful when wet masses of garbage are to be burned, since the maintenance of the temperature to destroy the garbage requires large amounts of fuel, and there is no provision for consuming the smoke and gases of combustion, threatening a discharge of noxious fumes from the chimney.

The Cragin, Dube, Long, and other refuse burners and water heaters are used in apartment houses and dwellings, and in a limited way are quite successful, but this method is distinctly confined to individual small installations for private work, and in no sense can be considered as a plant for municipal service. Several of these water heaters have the double water jacket connected with the hollow pipe grate, forming a circulatory system for the protection of the parts, but owing to the loss of heat taken up by the water their power as refuse burners is very limited.

The Smith-Siemans Garbage Furnace and Mr. M. V. Smith of Pittsburgh

One of the earliest furnaces for garbage and night-soil disposal was that invented by Mr. M. V. Smith in 1885, at Wheeling, W. Va. The history of the first furnace of this type has been briefly alluded to (MUNICIPAL JOURNAL, October, 1906).

The subsequent installations of Mr. Smith were in many particulars different from the early forms, and as built at Philadelphia and Atlantic City it was one of the most interesting and, in a way, successful attempts to cremate larger amounts of garbage than had been heretofore dealt with.

The Smith-Siemans garbage furnace (Fig. 62) was an imitation or modification of the Siemens process for attaining high temperatures in the work of iron manufacture. There are three distinct constructions, which together formed the complete apparatus.

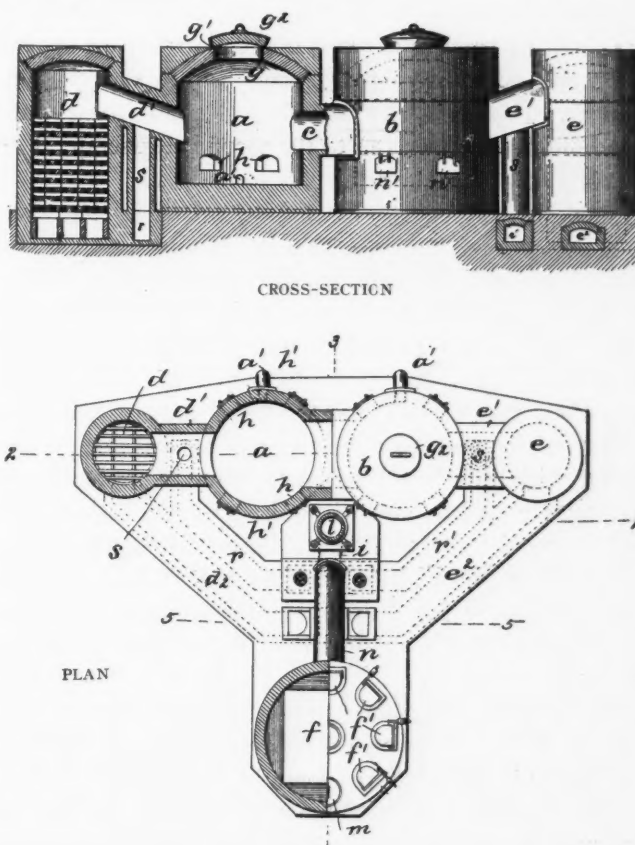


FIG. 62. M. V. SMITH GARBAGE FURNACE

These were (Fig. 62, plan) (a-b) the two garbage furnaces, the two regenerators (d-e), and the gas producer (f). Each of these separate constructions consisted of a steel exterior circular wall, which was lined with fire brick, and all were connected by a system of flues, controlled by dampers. The garbage chamber is charged through the roof, the waste falling on the bottom, and forms a conical pile. There are doors, through which the mass may be stirred, and at the bottom is a discharge spout (a'), which is opened for drawing of the liquids and afterward the slag, or residual products, from the chamber.

The regenerator chambers (d-e) are filled with checkerwork of fire brick and provided with flues (d¹-e¹) leading downward, so as to throw the flames directly upon the mass of garbage in the chamber (a). From the base of each regenerator is an air flue (d²-e²), connecting into a common chamber, which is provided with a reversible valve. These flues are also connected with the escape flue (i), which leads to the stack or chimney (L).

The producer (f) is provided with charging ports, through which the coal is passed for conversion into gas, and also has a garbage port which may receive waste for conversion into gas. There are valves and dampers to regulate and cut off the flow of gas and air, the purpose being to produce the gas for combustion from the garbage itself when the proper temperatures are reached.

The operation is begun by starting a fire in the gas producer, and as soon as gas is generated it is fed through the main gas flue (n) to the distributing chamber and by the flues (T¹) is carried to one of the garbage chambers (a¹). On its passage it receives the air from the regenerator and combustion takes place within the garbage chamber. From the chamber (a¹) the heat passes into the adjoining chamber (a) to the second regenerator (d) and from this through the air flue to the stack.

When the garbage in the first chamber is consumed the action is reversed, the gas then flowing through the ducts from the producer to the furnace (a), thence to the second furnace, which has meanwhile received a fresh charge, and through the first regenerator (e) to the chimney. It is claimed that when the highest temperatures are reached the garbage alone will produce the gas for its own combustion, with little or no assistance from the producer, but this seems to occur only when the garbage is comparatively dry and contains little moisture. During the operation of this furnace in Philadelphia and Atlantic City the repairs necessary for maintaining the complicated apparatus, exposed to very high temperatures, were made at a very considerable cost.

This furnace was reported upon by J. T. Featherston, Engineer-in-Charge of Street Cleaning Service, Borough of Richmond, and set forth some interesting facts. The period of operation reported upon was for the year ending September 1, 1902. Details were published in the MUNICIPAL JOURNAL AND ENGINEER of November 7, 1906.

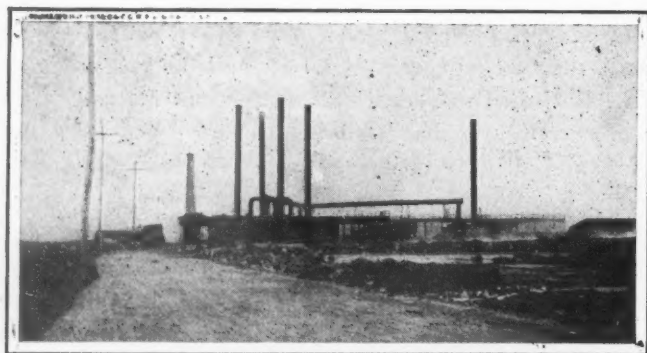


FIG. 63. GARBAGE CREMATORY, ATLANTIC CITY, N. J.
GENERAL VIEW, 1901

The Seaboard Garbage Cremator Co. and Mr. A. Vivarttas, New York City

One of the early furnaces for disposal of waste was invented by Mr. Aloha Vivarttas, of New York, who in 1887 built a large plant at East Seventeenth street, New York, under the style and title of the Seaboard Garbage Furnace Co., Patent No. 390,922, October, 1888.

This was the first furnace of its kind in New York City and was intended for the disposal of all classes of waste then collected together—ashes, garbage, and refuse—which was then dumped at sea.

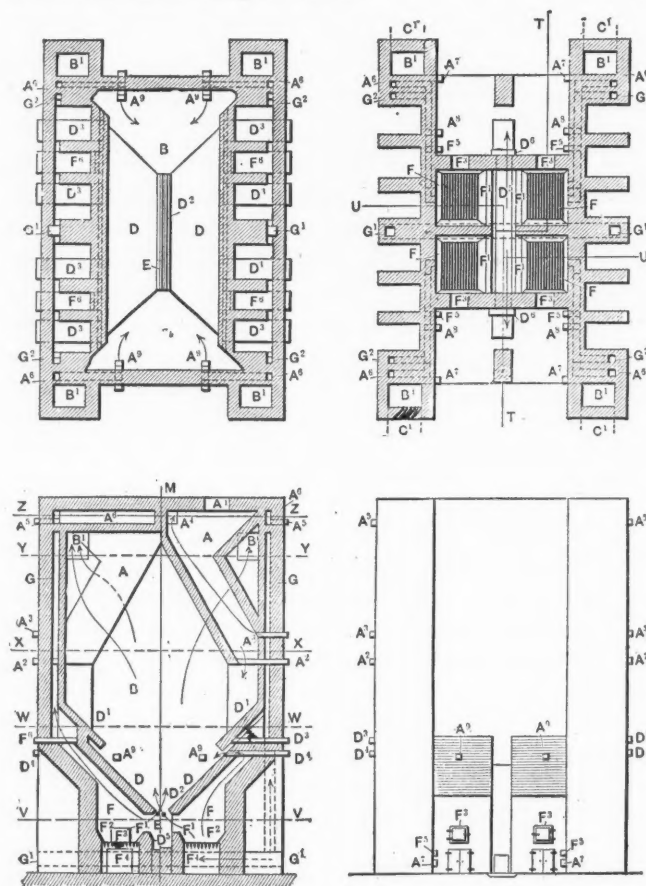


FIG. 64. VIVARTTAS GARBAGE CREMATORY, 1887.
PLANS AND CROSS-SECTION.

The furnace of Mr. Vivarttas, Fig. 64, was very high in proportion to the length and width, the exterior walls of the usual construction, the interior of fire clay, brick, and tiles. The top charging ports (a¹) discharge into small chambers inclined from the middle line to the furnace walls, and terminating in a chute (a³) controlled by a sliding fire clay dumper (H²). This upper chamber is then discharged upon a lower drying hearth (D¹), inclined at a sharp angle in the opposite direction from the one above. Thus there was formed an interior drying and burning chamber (B) of large capacity, into which all the smaller chambers above discharge, and in which the final combustion was made. The sides of this middle chamber (B), inclined to the center, lead the ashes and residuals of combustion down to a throat (D¹) or narrow flue, floored with water grates, below which the ashes are removed.

The two fireboxes (F F¹) are supplied with coal, the heat passing under the inclined hearth of the burning

chamber and through narrow passages behind the smaller charging chambers, and then downward through the four downtakes (B¹) to the chimney, by underground passages. In this New York installation there was also a conveyor for receiving the mixed refuse and ashes and passing this through a water bath to separate the heavy and lighter portions before charging into the furnace. But the conditions attending this disposal of mixed waste by fire were not then well understood. It was found impossible to produce and maintain combustion in the central burning chamber, there was poor provision for the removal of residuals, the furnace construction was too weak to stand the strain, and after many vain efforts to continue operation the attempt was abandoned in 1888.

Subsequently Mr. Smith, of Plainfield, N. J., became manager for this company and installed plants in Philadelphia, Plainfield, Scranton, and Fort Wayne, Ind. Three of these were in service for two to three years, but at this time none are operating except Scranton, and this will be discontinued shortly.

Tar Preparations for Road Purposes

THE idea has been commonly entertained in this country that Americans are more inventive and are better patrons of the Patent Office than are the citizens of any other nation, but along certain lines at least the English excel us in this. During the few years, for instance, when chemical precipitation was a favorite method for treating sewage, the English patent officer granted several hundred patents for preparations and combinations invented to effect this purpose. Another illustration was offered during the week ending May 25, when competitive trial was made in England of machines for spraying tar, and of preparations of tar for use in dust prevention. The machines which competed included a pneumatic tar sprayer, which discharged the tar from the spraying nozzles in a highly diffused state, the apparatus, which is attachable to an ordinary water cart or preferably used on a motor wagon having large tank capacity, consisting principally of an air receiver placed between the tank and the discharge pipe. The "Emulsifix" machine spreads tar oils onto the roads in the finest subdivided state by means of emulsifying it mechanically with water. Another process employed two machines, a heater, and a spreader, which work simultaneously, the former heating and the latter spreading. The "tarspra" machine carried a 700-gallon tank on a motor car and forced the tar through atomizing nozzles at the rear, where it was discharged in the form of a fine spray. Another machine first raised the temperature of the tar to a point which insured its setting like enamel on a road material, this apparatus permitting almost every kind of tar spray application, including dehydrated tar with air spraying pressure, pure cold or hot tar without pulverization and ordinary tar with a certain proportion of water with steam spraying pressure.

Nine materials competed in the test. The first, called

Crempoid, consisted of a mixture of glue and bichromate of potash, which, under the action of light, becomes insoluble. Glue and bichromate, though effective as a dust layer, is too dear and too brittle, so the inventors softened it by the addition of oil and other matter. Clare's Tar Compound is a specially prepared tar so provided and treated that the tar will be of uniform consistency both summer and winter. Ermenite is cottonseed oil treated with sulphuric acid, purified by washing and mixed with four times its weight of crude tar. Oil gas tar, which was furnished by the Gas Light and Coke Co., and which is liquid at ordinary temperatures, was applied by a water cart or suitable spreading machine. Hahnite is a mixture of carbolic acid, oil, asphalt and tar, and is applied by an ordinary water cart. Pulvicide consists of coal tar creosote, coal tar pitch and resin mixed together and melted by heat until solution is effected. A few other preparations of tar were experimented with also.

Another substance known as Akonia was used in Brighton, as were also calcium chloride and ordinary tar. The former was found more costly than ordinary watering, but was effective as a dust layer. Calcium chloride was found a little less effective, but also cheaper than Akonia.

Another Demand on Sub-Pavement Space

THE sub-surface portion of the streets of large cities is already well crowded with pipes, conduits, wire ducts, steam heating pipes, etc., but a new demand for space has recently been made by a "Telharmonic Company" for a franchise to lay wires "for the purpose of distributing music electrically." It seems somewhat difficult to take this proposition seriously, but it is a fact that this company has already constructed a plant at an approximate cost of \$300,000 for the creation of the music which is to be distributed by means of these wires, and the music is already being conveyed to certain outside points by wires leased from the New York Telephone Co. Owing to the fact that there is no similar plant in existence anywhere, the Bureau of Franchises is somewhat in a quandary to determine just what conditions to propose in connection with granting the desired franchises, especially since the company stated that it had absolutely no idea as to what its income would be or even as to the rate it would charge subscribers. They finally recommended as some of the provisions of the franchise the cash payment of \$25,000 and 1 per cent. of the gross receipts during the first five years, to be increased by 1 per cent. during each succeeding five-year period; that the company is to have in operation 400,000 "music outlets" in three years; that their wires are to be used for no other purpose; that they furnish free service for free wards in the hospitals and service at one-third the regular rates in the assembly halls of all public schools; that a penalty of \$100 per day for inefficient public service be imposed, and the other ordinary provisions commonly required of telephone and telegraph companies.

NEWS OF THE MUNICIPALITIES

Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Water Works, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

Roads and Pavements

ALBANY, N. Y.—Friends of the good roads system which was inaugurated by the State several years ago are alarmed at the reports which have been received from various sections of the State. It is declared that in some instances the contractors on improved highways have been allowed to slight the work, the result being inferior roads, while in other cases it is said that macadam roads which have been completed have been neglected and that unless steps are taken promptly by the State Engineer's Department the roads will be as bad as they were before the improvement. In Oneida county the Engineer-in-Charge has made the complaint that inferior work is the result of incompetent inspectors obtained through the Civil Service Department.

BALTIMORE, MD.—Mayor Mahool has written to City Engineer Fendall suggesting a plan which he hopes will tend to keep the streets in better repair. He says that the condition of things might be somewhat improved if the permits for street openings issued by the Department of Engineering were fixed upon a time limit basis. The permits could be so drawn that if they are not utilized within the stated period, or the work completed within that same period, the permit may be renewed by a simple application for renewal, the fact being noted by an indorsement on the back of the permit without the necessity of any delays in application. In general the public service corporations and the Department would be in closer touch and would be able to carry on their work more harmoniously.

BERLIN, GERMANY.—It is announced that Kaiser Wilhelm has just sanctioned a gigantic street improvement in Berlin involving an expenditure of \$37,500,000. It is proposed to widen the narrowest part of Friedrich strasse 20 feet and replace the present insignificant houses and shops by a magnificent array of palaces, galleries and hotels, making the street one of the grandest thoroughfares in the world. It is announced that four German banks and one British bank will finance the project.

BOSTON, MASS.—A contract for the paving of Water street with wooden blocks between Congress and Devonshire streets, has been given to the United States Wood Preserving Company, of New York. By the terms of the contract \$3.25 is paid for each square yard of wood block paving, which is an advance of 25 cents a square yard on the price paid for the work done between Milk and Beach streets last year. The cause of this increase is said to be the eight-hour law and the advanced price paid to teamsters.

HARRISBURG, PA.—Because they have more work than they can do or care to do at the price, the Barber Company and the Warner Quinlan Company refused to bid on ten paving jobs for which tenders were asked. The maximum price set of \$1.80 per square yard for asphalt and 87 cents per foot for granite curbing may not have been inviting or the fact that both of the companies have already received forty or fifty contracts each may have made them less eager for work. At any rate, the work will have to be readvertised.

LYNN, MASS.—The State Highway Commissioners have inspected the State Highway from the Point of Pines to Commercial street, Lynn, and have decided to treat the surface with a tar composition to repair the damage done by the heavy automobile traffic on the road. A count of

the automobiles passing at Commercial street shows an average of over 700 motor cars to and fro in eight hours daily. The macadam surface of the road has been so badly injured that the Commissioners suggest that the policing of the highway is probably inadequate as the road gives evidence that speed regulations have been disregarded.

NIAGARA FALLS, N. Y.—The Warren Brothers Company, which has the contract for the paving of North Main street, McKoon and Whitney avenues, has applied for permission to change their specifications so as to allow for the laying of a Portland cement concrete base instead of a bituminous base. This change is necessary because of the nature of the soil on the street and though the city will not have to pay any more for the better kind of bottom, the profit to the company will be materially cut. Mr. Smith, of the paving company, explained to the board that it was thought better to make the change rather than to be compelled to continually repair the street if the present plan was followed.

PEORIA, ILL.—The Council has passed a resolution directing the City Attorney to notify the Big Four Railroad to remove its buildings from a tract known as Market Square and to open the ground for general street traffic. It seems that the land was originally granted to the city for the public's use, that the railroad company has gradually taken possession of the property and built upon it. At one time they even proposed to build a round house upon it but gave the scheme up. The ground now taken by Mayor Schnellbacher and the Council is based on a Supreme Court decision to the effect that no City Council could grant away the streets or byways to any corporation or people to the detriment of the public.

SCRANTON, PA.—Although the plan for street improvements advocated by Mayor J. B. Dimmick was defeated at the polls, he intends to continue his efforts and will work especially for the paving under existing laws of unimproved streets in localities where traffic is heaviest.

TOLEDO, O.—Street paving work is active in Toledo this season. Operations are being conducted on 24 streets and the total number of square yards under construction is over 100,000. The largest single piece of work, carried after a long fight in Council, lower Summit street, amounting to over 30,000 yards, has not yet been let. Most of the work done so far is brick, although bitulithic, a paving new to Toledo, will be tried on several streets. To insure good work the city has engaged Mr. A. W. Dow to test and inspect all materials used on asphalt and bitulithic streets. It is not likely that asphalt blocks will be used in the near future, as most of the streets paved with this material, notably Erie street, laid only a short time ago, are in bad shape.

Sewerage and Sanitation

BRIDGEPORT, CONN.—The city has no Health Officer, legally has not had for the past ten years at least, and possibly never had one. A Health Officer has been appointed by the Board of Health from time to time, has served efficiently and has been paid a salary and expenses which he undoubtedly earned, but under the law he was not the Health Officer, the Common Council had no right to order his salary paid and the members of the Board of Health are legally liable for all the money disbursed in this way. Such is the opinion of the City Attorney,

James A. Marr. The statute seems to be clear in requiring that the appointment be made by the Mayor with the approval of Common Council or by the County Health Officer, in the absence of any special charter provision.

DALLAS, TEX.—A vigorous campaign is under way in the matter of oiling cisterns and cutting weeds and abating nuisances generally. "There are few places in the city in which there is any standing water," Inspector Doran reports, "but where there are pools that it is evident it will take several days to dry, we are spreading oil to kill off mosquitoes. We have oiled the unused cisterns in unoccupied places. We are calling upon all the citizens to screen the cisterns and to see to it that no water barrels are allowed to stand with breeding room for mosquitoes. Weeds are being cut. Where the owners are not found the city force will do the work and is doing so."

NEW WILMINGTON, PA.—The sewerage system, the construction of which has been delayed for two years on account of the failure of the borough to submit satisfactory plans to the State authorities, will, it appears, soon be built. The plan of a septic tank discharging into a creek has been abandoned, and in place three sand and gravel filters, with an area of an acre altogether, will be built. G. B. Zahniser, of New Castle, who is making the plans, has changed the location of the works a thousand feet lower down the stream than first intended.

ROCHESTER, N. Y.—On the presentation of a petition to the Council for permission of a property owner outside of the city limits to drain into a city sewer, Alderman William Ward is of opinion that such applications are altogether too frequent. He stated that real estate concerns were in the habit of advertising that their property located outside of the city had water and sewer privileges, although the property owner would not have to pay city taxes.

Water Works

BALTIMORE, MD.—Mayor Mahool announces his intention to compel the contractors who built the Mount Royal pumping station, which has recently settled and cracked, to restore their work in good order. The bond of the contractor who did the work runs for twelve years and is still in force. Mayor Mahool says the concrete in the pumping station foundation is so soft that he can pick out particles of it with his hand without the slightest difficulty. It is alleged, therefore, that the foundation of the building was not properly made.

JOHNSTOWN, PA.—The Johnstown Water Company, owing to discrepancies in its distributing system, has turned water into an old 10-inch natural gas main. Some concern has been felt as to the possibility of typhoid fever arising from this action and the Board of Health has stated that, after a thorough investigation, they find that exposure to such infection is remote if not impossible.

NIAGARA FALLS, N. Y.—The Board of Public Works has approved the plans for a new water supply system as recommended by Mayor Douglass. City Engineer Read has presented a detailed description of the scheme together with the estimated cost and expense of maintenance, as well as an estimate of the receipts. At the Board's meeting a fine large map of the whole system was also shown. Mayor Douglass offered a resolution which was unanimously adopted, recommending the distribution of 15,000 pamphlets, in which will be a detailed description of the proposed system, the chief features of which are: an intake pipe or tunnel, 48 inches in diameter, in the Canadian channel, 70 feet below the surface; a reservoir at the shore end of the tunnel; a pump house on the river bank with a turbine pump with a capacity of 30,000,000 gallons a day. The cost is estimated at \$425,000 and the expense of maintenance \$53,636.

PASADENA, CAL.—City Attorney Wood has given an

opinion to the City Council that the North Pasadena Land and Water Company must supply the people needing water in districts covered by their pipes, or they must remove their pipe from the streets. Litigation between citizens and the water company has been pending for some time, the company claiming that, being a mutual company, it will supply water only to its own stockholders, and threatening to withdraw service from persons who are not stockholders. As the company operates under a general law applying to cities in which there is no public supply, and in a way discharges public functions, it is bound to supply all citizens equally, just as the municipality would be bound to do if it had a water works.

PITTSBURG, PA.—Mayor Guthrie, Controller Larkin and Acting-Director Shepherd, of the Department of Public Works, recently made an inspection of the filtration plant. They found that filter beds numbered from 1 to 24 are finished, and those numbered from 25 to 46 are in the final stages of construction. The city owns ground on which ten more beds can be built. The 46 filter beds provided for in the contract are expected to filter 100,000,000 gallons of water a day. With preliminary filtration, 56 beds are figured to filter 200,000,000 gallons daily. The value of preliminary filtration is doubted by Councilman Warson, who wishes the present beds given a preliminary test before the matter be decided. It is estimated that a filter bed can be washed in 24 hours, so that only one and one-half filter need be out of commission.

NORTH BENNINGTON, VT.—The village of North Bennington is disturbed over the reports received from the State laboratory in regard to the poor quality of its water supply. Samples of water from fifteen wells were submitted and evidence of pollution was found in every instance. Among the samples condemned were those from the well on the common which a great many people in the vicinity use for domestic purposes, and also the well which supplies the pupils in the schools. There is one case of typhoid in town.

SPRINGFIELD, MASS.—The excellent work of the filtration plant at the Ludlow reservoir has saved Springfield citizens from drinking some of the worst water turned out by the reservoir in years. As a general rule the vegetable growths do not occur until the water has reached a temperature of about 70 degrees. In spite of the fact that the temperature of the water has been about 56 anabænae have been present in considerable quantities. The principal trouble has come from the uroglenæ which flourish at a lower temperature. They have appeared in remarkably large quantities and given the reservoir water a very fishy taste. Although the work put on the filters has been greater than ever before, the quality of the water turned out has been very satisfactory.

WASHINGTON, D. C.—Major Cosby, Engineer Officer in charge of the water supply system of the District, has reported to Gen. Mackenzie, Chief of Engineers, U. S. Army, that the operation of the experimental filtration plant has been very satisfactory. It has shown that an ordinary sand filter operated at fifty million gallons per acre day will do nearly all the work of purification and clarification when the applied water is of reasonably good quality, and that a second filtration amounts to nothing. When the water is more turbid, some work is done by the second filtration. The small amount of clay removed by the second filter is shown by the fact that there has been no loss of head after continuous use for four months. The results obtained in the Maignen group were similar. Somewhat less work was done by the preliminary filter and more by the second. The turbidity results were excellent, the clarification having been more complete than by either of the other systems.

Street Lighting and Electric Power

BOSTON, MASS.—A reduction of 5 cents per thousand cubic feet in the maximum price of gas has been announced by the Boston Consolidated Gas Company. This reduction will make the maximum price 80 cents per thousand. It is the fourth reduction that the company has made during the past two years, making a total reduction of 20 cents per thousand. This, the company announces, means a saving to the gas consumers of Boston during the year beginning July 1, 1907, of about \$800,000, as compared with the price before the local companies were consolidated two years ago.

DOVER, N. J.—At a recent fire which threatened to do serious damage, it was possible to shut off the gas only after the pipe was dug up in the street and plugged. Councilman Baker has called attention to the fact that the Dover, Rockaway and Port Oram Gas Company has not been putting in curb cocks on the service pipes. An ordinance was ordered prepared requiring that hereafter cocks be put on each service.

NEW YORK, N. Y.—In the report of Special Master A. H. Masten in the action taken by the Consolidated Gas Company, to upset the 80-cent gas law as unconstitutional, mention is made of the severity of the fines imposed for violations of the law. The company has about 390,000 customers in the city to whom bills are sent monthly, so that the penalty imposed by chapter 125 of the laws of 1906—\$1,000 for each charge for gas in excess of 80 cents a 1,000 feet—would amount in the aggregate to about \$390,000,000 a month and over \$4,680,000,000 a year, or 50 times as much as the value of the entire assets employed in complainant's gas business. The charge of \$5,000 a day for evidence recorded at each of the city's five testing stations for deficient pressure while amounting to \$1,800,000 a year seems too small to mention. These penalties are characterized as unexampled in extent and severity, amounting to a denial of the equal protection of the law.

PHILADELPHIA, PA.—At a public meeting of citizens at the Academy of Music, to consider the question of the new lease of the Gas Works, a series of resolutions was adopted, requesting Councils to notify the United Gas Improvement Company of the desire of the city to exercise its option of opening the lease to competition; that a committee be appointed to report proposals for bidding, and that Councils pass an ordinance authorizing the advertisement for bids to supply the city with gas for the next twenty years.

SYRACUSE, N. Y.—Members of the Syracuse Lighting Commission have started on their visits to cities which have municipal lighting plants for the purpose of inquiring into the cost of operating the plants and the rates for electric current. George W. Driscoll, John H. Barr and Adam Volles were named as a committee to visit Detroit and other western cities which own lighting plants. William H. Warner, John A. Mathews and Peter Eckel were authorized to visit eastern cities, including Norwalk and Holyoke.

Fire and Police

CINCINNATI, O.—In a recent bulletin the State Fire Marshal makes a comparison of the fire losses in Cleveland and Cincinnati. Cleveland, with a population estimated by the census bureau in 1906 at 460,327, lost by fire last year \$917,244, or \$1.99¼ per capita. Cincinnati, with a population estimated at 345,230, lost by fire \$620,950, or \$1.76 5-6 per capita. The average annual loss per capita in American cities is \$1.76. One reason for the heavier loss in Cleveland is the number of wooden buildings. That city has a greater population of wooden

buildings than any large city in the world except Milwaukee.

FULTON, N. Y.—The city is advertising for men to take a Civil Service examination for its paid Fire Department. The present salary of \$40 per month caused many to resign. It has been increased to \$45 per month and there are still few applicants. Low salaries are causing a lot of firemen to become ex-firemen in order to provide for the means of sustenance.

WAREHAM, MASS.—Spurred on by the promise of \$2.50 for every arrest that results in a conviction, the constabulary of Wareham has entered upon a period of active work looking to the detection of all kinds of crime, but principally with regard to the illegal sales of liquor. The activity on the part of the officers is due to the action taken at a town meeting when it was voted that the town increase by \$2 the bounty of 50 cents paid by the county for each conviction.

Government and Finance

ALBANY, N. Y.—There is some question in the mind of Mayor Gaus as to the legality of the ordinance which provides that city laborers shall be given a full day's pay in the event of work being stopped by rain after they have reported for work. The charter of cities of the second class places directly upon the Board of Estimate and Apportionment the duty of fixing the salaries of city employees. The Mayor will refer to Corporation Counsel Andrews the question as to whether the ordinance violates this provision of the charter.

NEW YORK, N. Y.—An announcement of the names of the men who will serve on the two Commissions created by the Public Utilities Act passed by the Legislature has been made by Governor Hughes. The Commission for the First District, comprising Greater New York, will be composed of the following members: Chairman William R. Willcox, now Postmaster of New York, a lawyer who has been interested in public affairs, including social work on the East Side; he was also instrumental in creating the system of small parks; William McCarroll, President of the New York Board of Trade and Transportation, who has been active in the affairs of manufacturers' and merchants' associations and is an expert on local transportation problems; Edward M. Bassett, a lawyer, former member of Brooklyn Board of Education, Member of Congress. As the head of a Brooklyn association of civic societies he has been a student of transportation problems. Milo Roy Maltbie, Secretary Municipal Art Commission, a student of civic affairs and quasi-public corporations. Has investigated public problems in the United States and abroad for civic associations and for the government. John C. Eustis, a lawyer, former School Commissioner and Park Commissioner and an active member of the Citizens' Union. The Commissioners for the Second District, the State except New York City, are: Frank W. Stevens, Chairman, Jamestown; Thomas Mott Osborne, Auburn; Charles Hallam Keep, Buffalo; James G. Sague, New Hamburg; Martin S. Decker, New Paltz. The Commissions, as the name indicates, will have supervision of all public utilities in the State.

As a result of a series of negotiations that have been carried on between Corporation Counsel Ellison and lawyers employed by union workmen, the 5,565 suits that have been brought against the city for alleged violations of the prevailing rate of wages law will probably be settled out of court. The suits aggregated \$10,000,000. Three weeks ago the lawyers met Mr. Ellison and suggested a compromise by which the plaintiffs in the suits receive the difference between the rate that was paid them and the prevailing rate in Manhattan, the city could get out of the difficulty for about \$1,100,000.

PATERSON, N. J.—An important decision has been reached by the Board of Finance so that hereafter seven days' pay will be held back in each city department. The heads of departments will have to make up their pay rolls in time to bring them before the Board of Finance for examination and signature in time for its regular meetings. Under the old system the pay roll was usually made up from the first to the fifteenth of each month, and then carried around to the various commissioners for signature. This gave them no chance to look it over carefully.

PORT HURON, MICH.—The Mayor expressed some surprise the other day when he was informed that the moneys paid into the City Treasury, by the Port Huron Gas Company, on franchise account, amounted to as much as 7 cents on each 1,000 cubic feet sold.

Refuse Collection and Disposal

CHARLOTTE, N. Y.—The water works system is out of commission and the village fire engine has been rented to the "Fighting the Flames" show in the park, so it could not be used to pump river water into the village sprinkling cart. But the situation had become desperate, and President Pye determined to relieve it, even if there was not cash available in the village treasury to pay the expense of sprinkling. He made an arrangement with the managers of the Genesee Furnace Company to pump the water from the river, and he hitched up his horse and backed the old sprinkling cart down to the river bank, followed by dozens of curious spectators. As he started on his first trip up the line cheer upon cheer arose, and several times, as he passed over the route, he was stopped and presented with huge bouquets of flowers. It was late in the evening when he turned in, and for the first time in several weeks the residents of the boulevard were able to sleep at night with their windows open.

MEMPHIS, TENN.—The Municipal Council held a brief meeting, at which the budget was passed. Their most interesting act was the creation of a new Street Cleaning and Sprinkling Department which will have \$75,000 for its annual expenses. Hitherto the Board of Health had been allowed \$35,000 for sprinkling, and the Engineering Department had had \$40,000 for street cleaning purposes. The two departments had not worked together in harmony. Hereafter one man will be responsible for the work, instead of three. A proposition from the street railroad to sprinkle streets for \$26 per mile was adopted.

NEW YORK, N. Y.—Many residential sections of the city are reeking with the stench of uncollected garbage which has been uncollected for nearly a week on account of a strike of the drivers of the Department of Street Cleaning. Under a clause in the city charter the Mayor is empowered, in the presence of great and imminent peril to the public health on account of impending peril, to authorize the Board of Health to take such measures and make such expenditures (beyond those duly estimated and provided for) as consideration for the public health may demand. Acting on this authority, Mayor McClellan issued an order to the Board of Health to remove the garbage. Dr. Bensal, Sanitary Superintendent of the Board of Health, immediately took charge and sent notices to labor bureaus and elsewhere asking for 600 laborers. Many gangs were organized and, under police protection, the collecting is proceeding day and night. In several sections of the city some rioting occurred. The Police Department is prepared to send a patrolman on or alongside of every cart, if necessary.

TOLEDO, O.—The garbage plant of the Toledo Reduction and Fertilizer Company has been ordered closed by Judge Kumler in the Common Pleas Court; after a thorough investigation of the complaints of the residents in

the vicinity. The odors arising from the plant, it is said, were unbearable and its continued operation was a menace to the public health. Time will be allowed the city to make other arrangements before the order is executed. In issuing the order, Judge Kumler took into consideration the fact that the interest of the creditors or bondholders would not be injured since the receiver's report shows that the enterprise is losing money.

Parks and City Beauty

BRIDGEPORT, CONN.—The Fayerweather Island project is the most interesting problem before the Park Board. It is planned to spend a definite sum every year upon extending Seaside Park towards the island and building the boulevard. President Eames and members of the commission are in favor of establishing an electric light plant for Seaside Park and consider it would be a good investment.

GRAND RAPIDS, MICH.—At a meeting of the directors of the Board of Trade, Chairman John B. Martin, of the Municipal Affairs Committee, read the report on the comprehensive plan for the improved city prepared by John Ihlder of the special committee for that purpose. The report went into the subject fully emphasizing among other things the utilization of the river front in the improvement scheme. It is proposed to have a corps of experts of national reputation prepare such a working plan for the city. The report included the presentation of the subject to the Common Council. It was recommended that the Board of Trade assist in the movement and share the expense of furthering the plan, the Council doing the same, each sharing in an appropriation of \$8,000.

GRAND RAPIDS, MICH.—The Park Commissioners have asked the City Council to buy 25 acres of level land east of and adjoining John Bull Park, the principal park of the city. Besides answering for the purpose of laying out a fine approach, the purchase would protect the park from disfigurement and injury by the possible erection of undesirable buildings.

PITTSBURG, PA.—Progressive citizens of Pittsburg and other cities are endeavoring to have their municipalities accept and put in force the law passed by the Legislature authorizing them to place the care and planting of trees along the streets under the control of the local authorities. The effect of such care is evident from the appearance of Washington, D. C., where the first of the trees were planted less than thirty years ago. The value of city care of trees has also been demonstrated in Newark, N. J., where the Shade Tree Commission, in existence only three years, has planted 55 miles of streets at an average cost of \$2.08 per tree, and cultivates them at a cost of three cents each.

UTICA, N. Y.—Seventy-five city officials, guests of Thomas R. Proctor, inspected each of four parks which Mr. Proctor purchased and has improved and will hand over to the Park Commissioners on January 1 next. The largest park, containing 260 acres on the high land overlooking the city, is named Roscoe Conkling Park. In the western part of the city a seventeen-acre park has been cleared up and finely arranged; it will be called the Addison C. Miller Park. Another park of the same size, already provided with an athletic field, is named Horatio Seymour Park. A small triangular park in the more thickly settled portion of the city, has been named Thomas J. Spriggs Park.

WILKES-BARRE, PA.—Albert Lewis has advised the Park Commission that he will furnish materials and construct a rustic house for the entrance to Frances Slocum playground. The house will be twenty feet square and erected at the point of the plot at the corner of the avenues so as

to form an entrance to the park through the house. The floor will be of concrete. The house will be built of birch, the bark to be left on the timber. The roof is to be of bark, while this part of timber will be used to secure decorative effects. Seats will be provided as a part of the house, as will also some boxes in which flowers will be planted. The whole effect will suggest the woodlands, which will be, of course, cool and refreshing in appearance.

Rapid Transit

CLEVELAND, O.—The Low Fare Railway Company has formally notified Council that it has failed upon the terms and conditions for the joint use of tracks, poles, wires, appliances and other property and electric current of the Cleveland Electric Railway Company upon the streets, avenues and highways of the city of Cleveland, the right to the joint use of which was conferred by an ordinance. The company, therefore, requests Council to fix the terms and conditions upon which it may be entitled to the joint use of the property mentioned.

JERSEY CITY, N. J.—A four-track elevated monorail road between Jersey City and Newark is being promoted by John H. Starin, Woodbury Langton and Charles Stewart Smith, all members of the late New York Rapid Transit Commission. A franchise will be applied for under the State franchise laws of New Jersey. It is proposed to run trains at not more than ten-minute intervals at a speed of from 60 to 100 miles an hour. The type of monorail to be used, the invention of Howard H. Tunis, a civil engineer of Baltimore, Md., is now on exhibition at Jamestown. The cars of this system are 47 feet long and six feet wide, and taper at each end. They are supported on two trucks of two wheels each, arranged tandem, flanged on each side. A great saving in cost of construction is stated by Mr. Starin to be effected by this system. For example, a three-track steel track elevated structure through New York costs about \$750,000 a mile, whereas it is expected that a four-track monorail viaduct can be built for \$75,000 a mile. It is stated that the fare between Newark and Jersey City will be three cents and that there will be a New York connection, taking passengers the whole distance for five cents.

NEW YORK, N. Y.—A fourth subway track between Ninety-sixth and One Hundred and Third streets was lately authorized by the Rapid Transit Commission. The object of this improvement is to allow express trains to the easterly and westerly branches of the southerly end of the subway to proceed over this section without any stop. The work, which will cost \$850,000, will be done by the Interborough; the money will be charged to the general construction account and provided by the city, but to be paid back to it within the next fifty years. The ventilating system will also be extended north of Fifty-seventh street, as the result in cooling the tunnel where it has been installed is very satisfactory.

Comptroller Metz, William F. Hurley, of the old Board of Rapid Transit Commissioners; George S. Rice, Chief Engineer of the Board, and N. T. Lewis, Advisory Engineer of the Board of Estimate, recently made an inspection of the greater portion of the tunnel under the East River, from Joralemon street, Brooklyn, to the Battery. On their return to the surface Mr. Metz gave out a statement for the party declaring that there was no evidence of faulty construction in the tunnel, and that it seemed certain that it would be ready for the operation of trains by October 1.

PHILADELPHIA, PA.—After an eight-hours' struggle the Rapid Transit ordinance passed the Select and Common Council. The ordinance is a contract with the Philadelphia Rapid Transit Company by which the city is to receive \$500,000 annually and a share in the rail-

road's profits, after 6 per cent. dividends have been paid, for fifty years. The company is confirmed in its rights to use the streets, and released from obligation to keep streets in repair. The city is to have a voice in the management of the affairs of the company. It is expected that the company will be placed in a position where it can borrow money and make extensive improvements.

Miscellaneous

JERSEY CITY, N. J.—An ordinance to abate the soft coal and smoke nuisance has been introduced in the Board of Aldermen by Alderman Robert Weir. The ordinance provides for the appointment of a Smoke Inspector, who shall receive a salary of \$1,500 a year, and who shall have authority to enter and examine all boiler rooms and all smokestack arrangements and to order changes in construction whenever they are necessary in order to prevent the emission of dense smoke. Where the escape of dense smoke is due to the construction of furnaces or boilers, the owner may submit plans for improved construction, and he will be given 30 days after the approval of the plan to complete the installation, after which he will be liable for a fine of from \$10 to \$50.

NEW YORK, N. Y.—A resolution was recently adopted by the Board of Aldermen authorizing the Mayor to expend without public letting a sum not to exceed six thousand dollars for the purpose of providing for the erection of signal towers, or triangulation stations, for the purpose of completing the triangulation of the city of New York.

NEW YORK, N. Y.—The New York Edison Company has been fined \$500 for two violations of the smoke ordinances in its plant at Thirty-eighth street and East River. The company's counsel said that to avoid making smoke the company now used nothing but anthracite coal, but that this produced the cinders named in one of the complaints. He further said that the company had spent \$200,000 in perfecting a smoke-consuming apparatus that would satisfy Dr. Darlington. This will soon be installed. Five other smoke offenders were also convicted and let down with a suspension of sentence.

PITTSBURG, PA.—Under the direction of the Pittsburg Chamber of Commerce, an effort is being made to have the city, State and Federal governments take up the task of saving Western Pennsylvania, and especially the city from the annual inundations of the river. The plan is to rear forests at the headwaters of the Allegheny and Monongahela rivers. Two billion trees would have to be planted, and fifteen years might pass before the object would be accomplished.

READING, PA.—Dr. W. F. Marks, President of the Board of Health, states that the Board has undertaken the most amicable means practicable to reduce, if not entirely banish, the smoke evil. For this purpose cards of instructions as to management of fires were recently posted in engine and furnace rooms throughout the town, together with a brochure or folder explaining the theory of combustion, for the enlightenment of manufacturers, firemen and engineers. The effort in this direction has met with success in those instances where strict attention has been given to the card of directions furnished.

SPRINGFIELD, MASS.—The Board of Health will take steps at once to secure the observance of the law recently passed which requires all factories and shops using machinery to maintain free of expense to their employees medical and surgical chests and appliances for the treatment of employees who may be injured or become ill upon their premises. The board will decide on what style of chests and equipment shall be required, and then it will be up to the State police and factory inspectors to see that the law is obeyed.

REVIEW OF THE PERIODICALS

Abstracts and Synopses of Important Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading United States Periodicals

Meaning of the London Election

It was to be expected that the editor of *The Arena* would have something to say about the London municipal election, which at first was so widely heralded as a blow to municipal ownership. This was an over prompt judgment which, it is fair to add, has since been quite commonly modified by fuller knowledge of the various issues. But *The Arena* for May, spurning modifications, desires complete retraction. In a very bitterly worded editorial, charging the deliberate misrepresentation of facts by a purchased press, the assertions of Charles Edward Russell, who had lately returned from Great Britain, were given at some length. These are that the election had no meaning one way or the other as to municipal ownership, because the policy is a settled one. The real cause for the overthrow of the Liberal County Council is described as the tax rate. The Council had striven "to change London from one of the darkest, most congested and non-progressive cities in the civilized world to a municipality worthy of the twentieth century;" and it had simply gone too fast. Its improvement expenditures are said to "involve something like \$100,000,000." The result was, mainly, a taxpayers' revolt.

Mayor of Portland, Me.

MR. WOODRUFF's article in the June number of *The World To-day*, "Six Times a Mayor," purports to be "a sketch of the public service of James P. Baxter, six times Mayor of Portland, Me." It is a good theme, for Mayor Baxter is intimately connected with Portland's recent progress—a progress that has been notable in many ways, but especially in park development. And that has been Baxter's special hobby. But the article itself is a little disappointing. It does not hang together; it says things were done, and does not tell how; it skips from pillar to post; it pays a compliment at this point and throws a bouquet from that point; it is not practical nor consecutive. The mayors who are readers of *MUNICIPAL JOURNAL AND ENGINEER* would find difficulty in getting any personal suggestions out of it, while it might have been made very much to the point. As to the park system, which the author states Baxter "himself originated and planned to the smallest detail," that must be an overstatement, for one of the most prominent landscape architects in the country was, we believe, employed, and probably thought of something. But the main conception was certainly Mayor Baxter's; and, aided by an intelligent and thoroughly sympathetic commission, he put through boulevard plans with energy and despatch, financ-

ing them and creating public sentiment. To further the latter work he wrote a little pamphlet, well illustrated, and dedicated it to the citizens of Portland. He also took the entire City Council to Boston at his own expense, that they might study a well constructed park system. That illustrates the Mayor's energy. He has always been, too, a man of affairs, so prominent in the higher life of the city that a better sketch of him would have been very interesting.

Rochester's Milk Experiment

To *McClure's* for June Samuel Hopkins Adams contributes a very readable and valuable account of "Rochester's Pure Milk Campaign." Interested—and especially uninterested—health officers in other cities will do well to read it. The whole campaign is based on this fact: "Next to air and water milk is the chief disseminator of human disease." Agitation against foul air and bad breathing is beginning to lower tuberculosis figures; water protection is becoming a science; while guardianship of a city's milk is yet in its infancy. Hence the value of Rochester's definite object lesson. As for the results, the death rate for children under five years of age for the two summer months during which the Rochester city milk depots are open has been more than cut in half.

The result is accomplished by furnishing not sterilized or pasteurized milk, but clean milk. With some difficulty Dr. George W. Goler, who is the chief Health Officer and the father of the movement, found a farmer who was willing to allow the city Health Bureau to experiment on his farm. "His establishment was by no means an ideal one; his barn was an old-fashioned affair; his cattle were none too carefully kept," and some of them had to be killed because they were found to be tubercular. Yet he was sufficiently interested to follow instructions. The plan, as gradually worked out, is this: "First, the milking pail is steamed, and the mouth of it covered with sterilized cheesecloth. The milkman, his hands carefully washed, milks through this cheesecloth, under the supervision of a Health Bureau nurse, the pail being then carried to a small shed where the sterilized distributing bottles are awaiting it." Double screen doors keep out flies; and "untouched by human hands, the milk is siphoned into bottles, which are at once sealed with sterile stoppers and packed in an ice box" to await shipment. The milk was delivered "last year" (probably 1905) to four selling stations, located in the poorer quarters of the city, since it is there that the child mortality is greatest. One depot was in a police station; one in a plumbing station; one in a hospital, and one in a small store. At each sta-

tion there is a nurse, to whose kindly and tactful advice to ignorant mothers, as to children's care and diet, Mr. Adams rightly thinks that some of the remarkable success is due.

The milk is sold at nine cents a quart, which is above the market price of ordinary milk; but even among the very poor it has come to sell largely, while the carriages of the rich are now beginning to seek the stations where really pure milk can be had. If the municipal enterprise could deliver the milk, the demand would probably exceed enormously the supply. As it is the city now "loses" about a thousand dollars a year by the experiment, which is reckoned to save a hundred and fifty lives each summer.

The farmer with whom the experiment began has continued to produce a milk clean enough to receive certification. Meanwhile, the little municipal plant of packing and sterilizing is moved each year to a new farm, for the educational effect. Further, all dairies are inspected at least twice a year. With any fall below a certain standard, the dairyman is notified. If conditions are not improved the retailer is warned against handling the product, and at last an embargo is put on the product, its sales being prohibited within the city limits. A retailer who adulterates his milk after receiving it is prosecuted in court. Up to 1905 nearly twenty per cent. of the milkmen in Rochester had been prosecuted successfully.

The Pure Milk Problem

THE matter of getting pure milk for cities, which is interestingly discussed from the public administrative side by Mr. Adams in *McClure's* for June, has an equally valuable discussion from the medical point of view in the *June Craftsman*. The latter article is by John Spargo. After making revelations, that to most laymen must be amazing, of the absolute dependence of humanity in a civilized state upon cows' milk, he comes to the attitude of city health boards toward the milk question. While there are eminent extremists who would shudder at so high a figure, he says, "that is generally regarded as reasonably clean and pure milk which does not contain more than twenty thousand to thirty thousand bacteria per cubic centimeter," for not all bacteria, it should be explained, are harmful. Yet, he says, "in Milwaukee the standard of 'purity' is 250,000 bacteria per c.c. In Boston it is 500,000—a standard worse, in many ways, than none at all! In many of our cities the average bacterial counts run well into the millions. Five millions, or about twice as many as average sewage, is not uncommon. . . . In most cities there is no bacterial standard at all." The results, in enormous infant mortality and in frequent epidemics—as, witness, the recent experience of Chicago with a scarlet fever scourge that started in a dairy farm—are too well known to need rehearsal. The author takes up the great work that is done in New York by Nathan Straus, in his depots for the sale of pasteurized milk, a work of which the results would seem, in an immensely lowered death rate among the children reached, to belie the accepted theory that pasteurization destroys nutritive qualities and leads to injurious effects. But "all the opponents of pasteurization concede that if milk is con-

taminated it should be pasteurized, while all the advocates of pasteurization admit that if pure milk, free from disease, could be secured, there would not be the slightest need of pasteurizing it." This brings the author to the Rochester experiment. He describes it with a detail that well supplements the description in *McClure's*, adding this interesting information regarding the Rochester bacterial count. Before the campaign the monthly counts ranged from 100,000 per c.c. in winter to 500,000 per c.c. in summer. The city's clean milk gives an average count of 3,853 per c.c. Only one sample has gone above 20,000, "twenty-one have been below 1,000—an almost unprecedented thing. One sample gave only 240, establishing a record for purity." These figures show that for a city of 200,000 population clean milk is possible and pasteurization is unnecessary. For a very large city the result could not, of course, be as easily obtained.

Trusting the People

THOUGH discussing the operation of the initiative and referendum in larger political divisions than municipalities—in canton and in nation—the article by Arthur Sherburne Hardy in *The Independent* of June 13 is interesting and suggestive. Mr. Hardy was recently United States Minister to Switzerland, so that he had unusual opportunities to learn the results; and his verdict is distinctly unfavorable. He quotes a statesman as saying that "the large number of abstentions proves that it is not the people, but a relatively small part of the electoral body which accepts or rejects a law." For instance, "in the case of so important a measure as the constitutional amendment of July 7, 1891, establishing the initiative, less than one-half the registered voters participated. From 1869 to 1888, in sixty-eight measures submitted to the people in Berne, the average abstentions was 45 per cent." In three communes of which the author speaks, only 19, 14 and 10 per cent. voted on a certain measure referred to the people. The judgments that are expressed are often as ill-advised as they are unrepresentative, the people giving way to a false and shortsighted economy to race or other prejudices, or to extreme conservatism, that would be perhaps more properly termed inertia. The author gives various concrete examples, of which a striking evidence seems to be the fact that it has become necessary to withdraw the budget from the referendum. "Expenditures justified by the national need and important for the national development, which indeed subsequently became the cause for national pride, would be vetoed by the taxpayers. Great measures of this nature are initiated by the far-seeing few, but are not favored by the cautious majority." Another striking example is "the law on epidemics, prescribing preventive measures, requiring physicians to report cases, decreeing compulsory isolation and vaccination—defeated in 1882 by a large majority. Private interests, family ties, and the prejudice of ignorance prevailed." "The statesmen of Switzerland itself," says Mr. Hardy, "shows no enthusiasm for either the initiative or referendum." This is the other side of the argument now becoming familiar in this country.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Periodicals Listed Below

- Acetylene Journal, Chicago.
 Ainsley's Magazine, New York.
 American Academy of Political and Social Science, Annals, Philadelphia.
 American Architect, New York.
 American Banker, New York.
 American Gas Light Journal, New York.
 American Homes and Gardens, New York.
 American Institute of Architects, Bulletin, New York.
 American Institute of Electrical Engineers, New York.
 American Magazine, New York.
 American Society of Civil Engineers, Proceedings, New York.
 Appleton's Magazine, New York.
 Architects' and Builders' Journal, Baltimore.
 Architects' and Builders' Magazine, New York.
 Architectural Record, New York.
 Architectural Review, Boston.
 Arena, Trenton.
 Associated Engineering Societies, Journal, Boston.
 Atlantic Monthly, Boston.
 Brick, Chicago.
 Broadway Magazine, New York.
 Canadian Municipal Journal, Montreal.
 Cement, New York.
 Cement Age, New York.
 Century, New York.
 Charities, New York.
 Clay Record, Chicago.
 Clay Worker, Indianapolis.
 Collier's Weekly, New York.
 Construction News, New York.
 Consular-Reports, Washington.
 Contract Journal, London.
 Cosmopolitan, New York.
 Country Life in America, New York.
 Craftsman, New York.
 Department of Labor, Bulletin, Washington.
 Eclectic Magazine, New York.
 Electrical Railway Review, Chicago.
 Electrical Review, New York.
 Electrical World, New York.
 Engineer, Chicago.
 Engineer, London.
 Engineering-Contracting, New York.
 Engineering and Mining Journal, New York.
 Engineering Magazine, New York.
 Engineering News, New York.
 Engineering Record, New York.
 Engineering Review, New York.
 Engineering Soc'y of West. Penn., Pittsburg.
 Engineering World, Chicago.
 Engineers' Club, Proceedings, Philadelphia.
 Everybody's Magazine, New York.
 Far Eastern Review, Manila.
 Financier, New York.
 Fire and Water, New York.
 Fireman's Herald, New York.
 Forum, New York.
 Franklin Institute Journal, Philadelphia.
 Gardening, Chicago.
 Gesundheits Ingenieur, Munich.
 Good Roads, New York.
 Harper's Monthly, New York.
 Harper's Weekly, New York.
 House and Garden, Philadelphia.
 House Beautiful, Chicago.
 Illuminating Engineer, New York.
 Independent, New York.
 Indian and Eastern Engineer, Calcutta.
 Insurance Engineering, New York.
 Iron Age, New York.
 Journal of Accountancy, New York.
 Leslie's Weekly, New York.
 Literary Digest, New York.
 Local Government Journal, London.
 McClure's Magazine, New York.
 Manufacturers' Record, Baltimore.
 Metropolitan Magazine, New York.
 Moody Magazine, New York.
 Municipal Engineering, Indianapolis.
 Municipal Journal and Engineer, New York.
 Municipal Journal, London.
 Municipal World, St. Thomas, Ont.
 Munsey's Magazine, New York.
 New England Water Works Ass'n Journal, Boston.
 North American Review, New York.
 Outlook, New York.
 Pacific Monthly, Portland, Ore.
 Pacific Municipalities, Santa Clara, Cal.
 Park and Cemetery, Chicago.
 Pearson's Magazine, New York.
 People's Magazine, New York.
 Popular Science Monthly, New York.
 Power, New York.
 Preventive Medicine Journal, London.
 Progressive Age, New York.
 Public Health, London.
 Public Service, Chicago.
 Putnam's Magazine, New York.
 Review of Reviews, New York.
 Revista Municipal, Havana.
 Rock Products, Louisville.
 Sanitary Institute Journal, London.
 Scientific American, New York.
 Scribner's Magazine, New York.
 Smith's Magazine, New York.
 Street Railway Journal, New York.
 Suburban Life, Boston.
 Success, New York.
 Sunset, San Francisco.
 Surveyor, London.
 Technique Sanitaire, Paris.
 Times Magazine, New York.
 Tradesman, Chattanooga.
 Travel Magazine, New York.
 Van Norden's Magazine, New York.
 Village, Hyde Park, Mass.
 Water, London.
 Water and Gas Review, New York.
 World To-day, Chicago.
 Western Municipal News, Winnipeg.
 World's Work, New York.

ROADS AND PAVEMENTS

Salt Meadow Roads in New Jersey. Illustrated description of how these are constructed. 2 1-2 pp. Good Roads, June.

Viaduct between the two Kansas Cities. Illustrated description of this recently opened structure. 2 pp. Cement World, June.

Street Pavements, The Development of. History and general description of present methods. Paper before the Franklin Institute. By George W. Tillson. Illustrated. 20 pp. Journal of the Franklin Institute, June.

Brick Pavements. General statements concerning. Illustrated. 8 1-2 pp. Municipal Engineering, June.

Brick Paved Country Roads Advantages Set Forth. By H. L. Jacobs. Illustrated. 1 1-4 pp. The Clay Worker, June.

Concrete Roadways in Richmond, Ind.—Paper before Assn. of Am. Portland Cement Mfrs. Illustrated. By H. L. Webber. 2 pp. Good Roads Magazine, June.

Asphalt Paving, Recent Progress in.—Abstract of paper. By G. Clifford Richardson, before Society of Chemical Industry. 3 pp. Engineering Record, June 1.

Tar Macadam Road at Mankato, Minn.—Description of construction. By R. E. Brown. 1-4 p. Engineering News, June 6.

Tar Macadam Pavement in Duluth, Minn.—Description of municipal plant and method of laying such pavement. By E. K. Coe. 1 1-4 pp. Engineering News, May 30.

Dust Prevention.—Description of test of materials and appliances in England. 1 p. Local Government Journal, May 25.

Dust Laying in Fairmount Park, Philadelphia.—By a new preparation. Illustrated. 1-2 p. Good Roads, June.

Dust Laying Materials, Effect of, on Fish.—Some observations of fish poisoning by road washings. By Aglio Dibdin. 3-4 p. The Surveyor, June 14.

Dust Nuisance, Six Methods for Alleviating.—Translated from Public Health Engineer. 3 1-2 pp. Technique Sanitaire, June.

Tarring Roads.—Discussion by T. D. Kelly. 1 p. The Surveyor, June 7.

Tar Sprinklers and Preparations.—Description of recent English tests. 1 p. The Surveyor, May 24.

Maintenance of Macadam Roads and Automobiles.—Discussion of effect of latter. 1-2 p. Engineering Contracting, June 19.

Maintenance of County Roads in England.—Paper before Assn. of Municipal and County Engineers. By J. W. Leebody. 3 1-2 pp. The Surveyor, May 24.
 Contract Journal, May 22.
 Repairing Asphalt Pavements, Cost at Utica, N. Y.—Compiled from accounts of thirty streets for twenty years. 1 p. Municipal Journal and Engineer, June 26.

SEWERAGE AND SANITATION

Sewerage System.—Hanley sewerage system and disposal works. Fully illustrated description. By W. H. Makepeace. 4 1-4 pp. Contract Journal, June 12.

Sewerage and Sewage Disposal Works of Colwyn. Paper before Association of Municipal and County Engineers. By Robert Green. Illustrated. 11 1-2 pp. The Surveyor, June 7. Contract Journal, June 5.

Pollution of New York Harbor.—Abstract of address by George C. Whipple before New York County Homeopathic Medical Assn. 1 1-3 pp. Engineering Record, May 25.

Sewer Construction, Cost of, at Atlantic, Iowa.—Itemized cost of three miles by the engineer in charge. 2 pp. Engineering-Contracting, May 15.

Pipe Joint, an English Non-rigid. Illustrated description of "rubite" joint.

1 2-3 pp. Mun. Jour. and Eng., June 12.

Sewage Pumping Stations and Machinery.—Paper before Assn. of Municipal and County Engineers. By Henry A. Cutler. Illustrated. 10 pp. The Surveyor, May 24. Contract Journal, May 22.

Sewage Lifting Apparatus. Description of an automatic lift. Illustrated. 1 3-4 pp. Gesundheits-Ingenieur, May 18.

Sewage Disposal at Greetland (England).—Brief description. 1-2 p. The Surveyor, June 7. Contract Journal, June 5.

Septic Tanks at Malvern, England. Brief description of reinforced concrete walls, etc. 1-4 p. Engineering Record, June 1.

Trade Wastes in Reading, Pa. Sewage investigation of their effect upon purification. 1 1-4 pp. Engineering Record, May 25.

Colloidal Matter in Waste Water, Discussion of Absorption of. By Prof. W. Blitz and Dr. O. Kröhnke. Illustrated. 3 1-2 pp. Gesundheits-Ingenieur, May 25.

Benefits of Sewerage.—Metropolitan main drainage and its effect on mortality. Attempt to show the enormous benefits by mortality statistics. By P. C. Smith. 14 pp. Public Health, June.

Board of Health, Ohio State, Work of, on Water Supply and Sewage Disposal.—By R. Winthrop Pratt. 1 1-2 pp. Engineering News, June 20.

Mortality Reports.—Incompleteness of health and mortality reports. 1-2 p. Mun. Jour. and Eng., June 26.

WATER SUPPLY

Water Supply System.—Metropolitan water works system of Mass. By Caleb M. Sarille. Illustrated. 5 pp. Municipal Engineering, June.

Northfield Water Works System. Description of a Vermont system. By C. E. Fuller. 3-4 p. Fire and Water, June 19.

Colorado Springs Water Supply. Description of water shed and system. Illustrated. 2 1-4 pp. Mun. Jour. and Eng., June 5.

Archangel, Russia, Water Works. Description of works in the Arctic regions. Illustrated. Abstract of paper before Am. Soc. of Municipal Improvements. By U. E. Taubenheim. 1 1-2 pp. Mun. Jour. and Eng., June 5.

Mankato, Minn., Water Works. Brief description. 1-2 p. Mun. Jour. and Eng., June 26.

Montreal Water Works. Expert's report on the proposed plan. Illustrated. 1 p. Canadian Municipal Journal, June.

Colwyn Bay Water Works. Paper before Assn. of Municipal and County Engineers. By T. B. Farrington. Illustrated. 2 1-2 pp. Contract Journal, June 12.

Water Works of Portadown and Banbridge. Paper before Assn. of Municipal and County Engrs. By R. H. Dorman. 3 pp. Contract Journal, May 29.

Pumping Engines, High Duty and Low Duty.—Selecting between these for a given plant. Abstract of paper before Am. W. W. Assn. By I. H. Reynolds. 1 1-2 pp. Engineering Record, June 22.

Centrifugal Pumps, Recent Development and Future Application of. Paper before Ohio Society of Mechanical, Electrical and Steam Engineers. Compares centrifugal and reciprocating pumps. By D. S. Brown. 1 1-4 pp. The Engineer, June 15.

Pumping Water by Producer Gas. Paper before Am. W. W. Assn. By F. A. Barbour. 2 1-2 pp. Water and Gas Review, June.

Water Pipes of Reinforced Concrete.—Description of French pipes used under 120 ft. head. 2-3 p. Contract Journal, June 5. The Surveyor, May 24.

Wood Stave Pipe, the Life of. Editorial. Discussion. 2-3 p. Engineering Record, June 1.

Repairing Steel Water Mains. Method employed at Rochester. Illustrated. 1-2 p. Mun. Jour. and Eng., June 19.

Steel Pipe Canal Crossing. 41-inch pipe at Birmingham, England. Illustrated. 1-3 p. Mun. Jour. and Eng., June 5.

Vitrified Pipe Water Conduit. Sewer pipe carrying water under 14 pounds pressure, at Hobart, Okla. Illustrated. 3-4 p. Mun. Jour. and Eng., June 5.

Standard Specifications for Water Pipe.—Comparison of those reported by Committee of Am. W. W. Assn. with the N. E. W. W. specifications. 2 pp. Mun. Jour. and Eng., June 19.

Obstructions in Water Mains, Testing for, with a Scraper.—Description of work done in Ireland. By R. H. Dorman. 1-2 p. Engineering News, May 30.

High Pressure Fire Service.—Pumping station at Coney Island. Description of plant and test. By B. Franklin Hart, Jr. Illustrated. 9 pp. Stevens Institute Indicator, April.

High Pressure Fire System. Suggestions for. Fixed nozzles at 30-foot intervals proposed. 1-2 p. Mun. Jour. and Eng., June 5.

Double Systems of Water Mains.—One for fire and impure water, other for potable water. 1 1-4 pp. Mun. Jour. and Eng., June 19.

Private Fire Protection Services.—Connections from water mains. Paper before Am. W. W. Assn. By A. W. Hardy. 1 1-4 pp. Water and Gas Review, June.

Water Meters in France.—Brief discussion. 3-4 p. Mun. Jour. and Eng., June 5.

Meters and Meter Systems. Paper before Am. W. W. Assn. By W. Volkhardt. 1 1-4 pp. Water and Gas Review, June.

Water Meter Data. Reports from 25 cities tabulated. 2-3 p. Mun. Jour. and Eng., June 5.

Water Rates for Fire and Domestic Service. A Fair Basis for Fixing.—By S. J. Rosamond. 3 1-2 pp. American Municipalities, June.

Reservoirs, The Silting of.—Abstract from paper read at Second Conference of Engineers of the U. S. Reclamation Service. By W. M. Reed. 2-3 p. The Surveyor, June 14.

Settling Reservoirs. New Cincinnati water works. Illustrated description of construction. By Wm. C. Jewett. 3 pp. Engineering Record, June 8.

Underground Water Surveys.—Accuracy of those by U. S. Geological Survey. 1-3 p. Mun. Jour. and Eng., June 5.

Pollution of Underground Waters, Detecting and Tracing the Source. Paper before Association of Water Engineers (England). By John C. Thresh. With discussion. 3 pp. The Surveyor, June 14.

Treating Water, Variety of Methods for.—Brief discussion. 1-2 p. Mun. Jour. and Eng., June 5.

Sand, Contact and Sprinkling Filters. Comparison of these in disposal of organic matter. Abstract of paper before

Am. Public Health Assn. By H. W. Clark. 2 pp. Engineering News, June 6.

Filtration, Modern Tendencies in. Latest theories and present status of preliminary, slow and rapid filtration. By George C. Whipple. 1 3-4 pp. Mun. Jour. and Eng., June 5.

Slow Sand Filtration Plant at Denver, Col.—Description of this new plant and other features. Illustrated. 2 1-2 pp. Engineering Record, June 22.

Water Filtration Plant, Pittsburg's New. Illustrated description of the plant and its operation. 3 1-2 pp. By Fred W. Hagloch. Cement World, June.

Jewell Filter. Report on experiments made on a test plant, written by Carl Schreiber, translated by F. Briot. (Continued.) 6 pp. La Technique Sanitaire, June.

Compressed Air Bar for Water Purification.—Description of a German patent. Illustrated. 3 pp. Compressed Air, June.

Preliminary Filters for Albany's Water Supply. Description of improvements, for which contract has recently been let. Illustrated. 1 p. Eng. Record, May 18.

Preliminary Treatment of Water at Washington, D. C. Description of Experiments. Illustrated. 1 1-2 pp. Engineering Record, May 25.

Removing Iron from Potable Water. Brief discussion. By H. Schwes. 3-4 p. Technique Sanitaire, June.

Sterilizing Water by Ozone. Theory, and some apparatus used for the purpose. Illustrated. 2 1-2 pp. Mun. Jour. and Eng., June 5.

Water Softening for Municipalities. Discussion of paper before Am. W. W. Assn. By P. A. Maignen, C. A. Brown and others. 2 1-2 pp. Water and Gas Review, June.

Biology of Potable Water (continued). By Adolph Kemna. 3 1-2 pp. La Technique Sanitaire, June.

Statistics Concerning Water Works in twenty cities. Compiled from National Board of Underwriters' reports. Deals with all branches of water supply plants and service. 3 1-4 pp. Municipal Journal and Engineer, June 5.

Literature on American Water Works. Books and periodical articles indexed. By E. S. Bradford. 1 3-4 pp. Municipal Journal and Engineer, June 5.

STREET LIGHTING AND ELECTRIC POWER

Municipal Electric Lighting at Burlington, Vt. Cost of plant and operation. 2-3 p. Engineering News, May 30.

Municipal Electric Lighting Plant, Cleveland, O. Illustrated description. 2 1-2 pp. Electrical Review, June 15.

Municipal Lighting of Grand Rapids. Some figures concerning the operation of this plant. By Mark Foote. Progressive Age, June 15.

Municipal Electric Plants, London's. Financial statement for 1905-06. 1-2 p. Municipal Journal and Engineer, June 12.

Electric Light Rates in Iowa. Statistics collected by J. P. Minchen. 2 1-2 pp. Midland Municipalities, May.

Municipal Gas Plant. Report of attempts to purchase Wheeling's plant. 2 pp. Light, Heat and Power, June.

Gas and Water Plants of Danville, Va. Improvements and finances. 1 p. Municipal Journal and Engineer, June 12.

Philadelphia Gas Lease Bills. Discussion, etc., relative to future action upon expiration of present lease. 2 pp. Progressive Age, June 1.

Gas, 80c. Abstract and discussion of report of Master in Chancery, Arthur H. Masten, re. New York City vs. Consolidated Gas Co. 2 1-4 pp. American Municipalities, June. 1 1-2 pp. Progressive Age, June 1.

Gas, 60c. Explanation of how this price is possible at Hamilton, O. 3-4 p. Progressive Age, June 15.

Gas Regulations. Those in force in Detroit and New York. 1-2 p. Municipal Journal and Engineer, June 26.

Incandescent Gas Lighting. Methods of calculating outdoor illumination. Abstract of article. By Dr. L. Block. Progressive Age, June 1.

Street Illumination in Denver. Illustrated. By Frank C. Farrer. 5 pp. Illuminating Engineer, May.

Standard of Illuminating Power and Price of Gas in Great Britain. By Charles W. Hastings. 5 pp. Illuminating Engineer, May.

Illumination Engineering. Abstract of lecture on. By L. B. Marks. 4 1-2 pp. Stevens Institute Indicator, April.

GOVERNMENT AND FINANCE

Municipal Ownership. Practical objections to "Municipal Ownership of Public Utilities." By John W. Hill, M.A.S.C.E., Chief Engineer, Cincinnati (municipal) Water Works. 4 1-2 pp. The World To-day, June.

Significance "Falsely" Attached to the London Municipal Elections. Editorial. 2 1-2 pp. The Arena, May.

Municipalization in Berlin. Some items of information from a correspondent. 1 1-2 pp. Progressive Age, June 15.

Initiative and Referendum. Current news of. Collected by Ralph Albertson. 4 1-2 pp. The Arena, May.

In Operation. An account of the experience of Switzerland. By Arthur Sherburne Hardy. 4 pp. The Independent, June 13.

Government by Commission for American Cities. Description of the recent movement in this direction. 1 1-2 pp. Revista Municipal, June 15.

"Chicago's New Charter, Limited." Editorial. 1 p. The Review of Reviews, June.

Ibid. Editorial. 1 1-2 pp. The World To-day, June.

Ibid. Editorial. 1 p. The Outlook, June 8.

"Louisville Election Case." Discussion of the Court of Appeals decision on the election of 1905. Editorial. 3-4 p. The Outlook, June 15.

"One Man City Government." Report of James B. Reynolds to the President on the administration of Washington, D. C. Editorial. 1 1-3 pp. The Independent, June.

Tax Evasions on the Part of Public Service Corporations. Editorial. 2 pp. The Arena, May.

"San Francisco's Corruption." The work of Prosecutor Heney. Editorial. 1 1-2 pp. The Independent, May 30.

The San Francisco Revelations as Showing the Source of Corruption. Editorial. 1 1-2 pp. The Arena, May.

Public Service of Mayor James P. Baxter of Portland, Me. "Six Terms a Mayor." By Clinton Rogers Woodruff. 3 pp. Portrait. The World To-day, June.

Municipal Accounting. Iowa's Uniform System of Substance of. Substance of State law recently gone into effect. 1-2 p. Municipal Journal and Engineer, June 5.

Municipal Auditing. Discussion of Municipal English Finance. 1 p. Municipal Journal, May 17.

Accounts, the Philosophy of. Treatise on general accounting, including public utilities (continued). 9 pp. By Charles E. Sprague. Journal of Accountancy, June.

Depreciation. Paper before Institute of Electrical Engineers. By Robert Hammond (concluded). 2-3 p. Municipal Journal, May 17. Electrical Railway Review, June 1.

Depreciation. Abstract of paper before Institute of Electrical Engineers. By Robert Hammond. 2 pp. Progressive Age, June 1.

Bond Sales, Municipal. Data concerning bonds and city finances. 1 p. Municipal Journal and Engineer, June 5.

REFUSE COLLECTION

AND DISPOSAL

Refuse Destructor Plants, English, German and Swiss. By Frank C. Perkins. Illustrated. 4 1-2 pp. Municipal Engineering, June.

Refuse Destructor operating a municipal electric railway plant at Preston, Eng., described and illustrated. By Frank C. Perkins. 4 pp. Electrical Review, June 8.

Disposal of Municipal Waste. Description of American systems. Illustrated. By W. F. Morse. 4 1-2 pp. Municipal Journal and Engineer, June 5.

Street Cleaning by Citizens in Chicago. Description of work done by Citizens' Street Cleaning Bureau in the business district. Illustrated. 3 1-2 pp. Engineering Record, May 25.

Women Street Sweepers in Munich. 1 p. The Craftsman, June.

Flushing Gutters, French Appliance for. Illustrated. 2 pp. Technique Sanitaire, June.

PARKS AND CITY BEAUTY

Park Expansion in Paris, Need of. "Where Paris Lags." 1-2 p. Notes and Comments department, Architectural Record, June.

"Recent Park Development." A paper prepared for the 1906 convention of the American Civic Association. By Andrew Wright Crawford. 10 pp. The Chautauquan, June.

"Omaha's Park System, Growth and Extent of." 3 pp. Illustrated. Park and Cemetery, June.

Mountain Park in Riverside, Cal. 1-2 p. Illustrated. Park and Cemetery, June.

Park Notes. News items. 1-6 p. Gardening, June 1.

Park Improvement Notes. 1 1-2 pp. Park and Cemetery, June.

Park News Notes. 1 p. Park and Cemetery, June.

Playgrounds in Grand Rapids. Editorial. 1-2 p. Charities and the Commons, June 5.

"Beauty in the City House, Possibilities of." What architect and occupant can do. 6 1-2 pp. Illustrated. The Craftsman, June.

"City Making." A paper prepared for the 1906 convention of the American Civic Association. By Frederick L. Ford. 4 pp. The Chautauquan, June.

Replanned Copley Square, Boston. Description. 1-2 p. Notes and Comments department, Architectural Record, June.

"Architecture and Civic Progress." A paper prepared for the 1906 convention of the American Civic Association. By Prof. Fred'k M. Mann. 6 pp. The Chautauquan, June.

"Civic Beauty and Civic Safety." A paper prepared for the 1906 convention of the American Civic Association. By Fielding J. Stilson. 5 1-2 pp. The Chautauquan, June.

Tree Planting on City Streets. A suggestion for "avoiding monotony." By Sid. J. Hare. 1 p. Illustrated. Park and Cemetery, June.

Railroad Gardening, Intelligent Methods in. Illustrated description of some successful efforts in the picturesque treatment of railroad stations. By Frances Copley Seavey. 2 pp. Park and Cemetery, June.

TRAFFIC AND TRANSPORTATION

Subway Locations, Cambridge, Mass. Consulting engineer's report on various conditions affecting these. Illustrated. 3 pp. Street Railway Journal, June 15.

Rapid Transit in Boston and Vicinity. General description of the present lines. Illustrated. By Edward Hungerford. 3 1-2 pp. Electric Railway Review, June 1.

Belmont Tunnel, New York City. Description of boring operations. Illustrated. 2 pp. Engineering Record, June 8.

Depressing Tracks at Newton, Mass. 3-4 p. Municipal Journal and Engineer, June 26.

Steel Passenger Cars for the Hudson Companies' Tunnel Service. Description of a new design. Illustrated. By Hugh Hazelton. 6 1-2 pp. Street Railway Journal, June 8. Electric Railway Review, June 15.

Street Car Fenders. Report of Massachusetts Railroad Commission Concerning. 3-4 p. Municipal Journal and Engineer, June 12.

MISCELLANEOUS

Civic Improvements, Various Notes on. 6 pp. Notes and Comments department, Architectural Record, June.

Notes on Current News of. 2 pp. Charities and the Commons, June 15.

Notes on Current News of. 3 pp. Illustrated. Park and Cemetery, June.

Work of the Auburndale (Mass.) Society. "An Improvement Society Which Has Done Much for a Bay State Community." By Colon S. Ober. 1 p. Illustrated. Suburban Life, June.

Art Emphasis in. "The Vital Forces of Civic Betterment." Editorial. 1-2 p. American Homes and Gardens, June.

Papers prepared for the 1906 convention of the American Civic Association. These include the secretary's report, "The National Impulse for Civic Improvement," and other papers here indexed according to topic. 86 pp. Civic Improvement number, The Chautauquan, June.

"The National Significance of Washington Improvements." A paper prepared for the 1906 convention of the American Civic Association. By H. B. F. Macfarland. 17 1-2 pp. Illustrated. The Chautauquan, June.

"Texas Cities and Their Improvement." A paper prepared for the 1906 convention of the American Civic Association. By Mrs. William Christian. 6 pp. The Chautauquan, June.

"What One Association Did." An account of the work at Framingham, Mass., prepared for the 1906 convention of the American Civic Association. By Frederick A. Whiting. 5 pp. Illustrated. The Chautauquan, June.

"Redeeming the Ugliest Town on Earth." What "the Craftsman movement" did for Butte, Mont. By Helen

Fitzgerald Sanders. 12 1-2 pp. Illustrated. The Craftsman, June.

Tyngsborough Tree Society. An account of the first improvement society in the United States. 1 p. Illustrated. Park and Cemetery, June.

Billboard Legislation. A digest of recent ordinances, bills and decisions. 2 pp. Park and Cemetery, June.

Public Works of Colwyn Bay. Description of. Paper before Association of Municipal and County Engineers. By William Jones. 4 pp. The Surveyor, June 7. Contract Journal, June 5.

Descriptions of Cities. "Impressions of New York." Criticism and eulogy. By T. P. O'Connor. 5 pp. Munsey's, June.

"Galveston: An Epitome of American Pluck." The rebuilding of the city. By Frank Putnam. 17 pp. Illustrated. New England Magazine, June.

"Tripoli in Barbary." A tourist's impressions. By Charles Wellington Furlong. 13 pp. Illustrated. Harper's Magazine, June.

Southern State Cities. Many views and some scattered descriptive text in the various articles in the Southern number of The World's Work, June.

The People of New York City. "How New York Appears to a Southern Woman." By Mrs. L. H. Harris. 3 pp. The Independent, June 13.

"The Regeneration of San Francisco." By Ex-Mayor James D. Phelan. 4 pp. The Independent, June 20.

Housing. Bad Tenements in Milwaukee. "The Housing Problem in Wisconsin." By Dessa Kunz. 9 pp. Illustrated. Charities and the Commons, June 1.

Farm Colony, the New York City. Description of a Home for Aged and Infirm on Staten Island. 4 pp. By Elizabeth Tower. Charities, June 22.

Pasteurizing Milk. "Practical Method of Improving Cities' Milk Supply." By John Spargo. 14 pp. The Craftsman, June.

"Rochester's Pure Milk Campaign." By Samuel Hopkins Adams. 8 pp. Illustrated. McClure's, June.

Electrolysis. Discussion of papers before American Institute of Electrical Engineers. 4 1-2 pp. Progressive Age, June 1.

Electrolysis and Three-Wire Electric Roads. Results from changing from two-wire system in Boston. 1-2 p. Municipal Journal and Engineer, June 5.

Vagrant Currents. Protecting Water and Gas Pipes from. Paper before Verein von Gas und Wasserbachmannern. By W. H. Lindley. Illustrated. 4 1-2 pp. Technique Sanitaire, June.

Water and Sewage Conduits of Konigsburg. A review of brief statement of recent extensions. 2 pp. Gesundheits-Ingenieur, June 8.

Pipe Laying. Simple Devices for. 1-2 p. Municipal Journal and Engineer, June 5.

Record-Keeping on Street Paving. Form used at Hattiesburg, Miss. 1-2 p. Municipal Journal and Engineer, June 5.

Specifications, the Enforcement of. Residential address before American Society for Testing Materials. By Charles B. Dudley. 5 1-2 pp. Iron Age, June 27.

Public Utilities Law, New York State. Description of its main features. 1 1-4 pp. Electrical Railway Review, June 8.

Chicago Telephone Report. Review of the situation by experts. Illustrated. 15 pp. Telephony, June.

Smokeless Fuel. Sort of coke invented in England. 1-2 p. Municipal Journal and Engineer, June 26.

Portland Cement, Simple Tests for. Tests for which only home-made appliances are needed. Illustrated. 1 p. Municipal Journal and Engineer, June 19.

Highway Bridges of Reinforced Concrete. Advocacy of these. Illustrated. 2 pp. By Layton F. Smith. Concrete, June 15.

Flood Protection at Ithaca, N. Y. Description of work done to effect this. Illustrated. 1 3-4 pp. Engineering Record, June 8.

Rolling Earth, New Method of. Rolling tamper used for "Santa Monica system" of oiled roads. Illustrated. 3-4 p. Municipal Journal and Engineer, June 26.

Automobiles for Engineers and Contractors. Usefulness and most desirable models. 1 p. Engineering Record, June 8.

Panama Canal, Municipal Engineering on. From paper before St. Louis Railway Club. By F. B. Maltby. 1-3 p. Engineering Contracting, June 19.

BOOK REVIEWS

Combustion and Smokeless Furnaces.—

By Joseph W. Hays. Published by the Hill Publishing Company, New York.

—This book has been prepared to meet the needs of the owners and engineers of steam power plants and consequently contains a great deal of elementary information which would not be required by mechanical engineers or others already familiar with the subject. The author presents, in a brief and clear way, the general theories of combustion and the practical conditions affecting it when employed for the heating of water in boilers. The "smoke evil," the author states, would be more comprehensively described as the "chimney evil," since there may be an output of poisonous gases which are fully as injurious to the health as is smoke itself. These evils he classifies as hygienic and economic. The author, in chapter 5, considers smoke-consuming devices and smokeless furnaces in general; the latter being divided into mechanically-fired furnaces and hand-fired furnaces. The former include both under-feeding and over-feeding stokers, the chain grate, inclined grate and fuel spreaders. He also discusses pulverized fuel burners, which he does not believe warrant serious consideration. The features of hand-fired furnaces to which he devotes special attention include natural draft, mechanical draft, steam jets, and the introduction of air through the grate, the fire door, the side walls, the bridge wall and the arch. He also discusses fire-arch furnaces, which he classifies broadly as those with the arches above the grate, above the bridge wall, and in the combustion chamber. Dutch oven and down-draft furnaces also receive brief consideration. In his conclusions the author states that "the man who is looking for absolute perfection in this field will be disappointed, for nothing in the furnace line can be endowed with the factor of intelligence, and even if so endowed it would often have a hard proposition to contend with in the ignorance and carelessness of the men in charge of the boiler." He maintains that a successful device must be adjustable to meet any combinations of conditions which may be

offered by the boiler, grate, draft, etc.; and calls attention to the injuries which may be done to the boilers, boiler setting or grates by improper installations. Throughout the work he frequently states his belief that the only proper way to test the working of a boiler and also for judging the efficiency of any such device as is considered by this work, is by means of fuel gas analyses. If these be properly made, "the amount of water evaporated per pound of coal, the quality of the steam and every other item that must be noted in connection with an evaporation test may be disregarded." The author has made free use of theories and data contained in the works of Thurston, Kent, Rankin, Hutton, and a considerable number of other writers, both of text-books and of technical and periodical literature. Altogether, he has placed in the 101 pages of this work probably as much information of the kind already described as could be clearly stated in a like space, and this is in general impartial and free from any personal hobbies.

Passaic River Flood District, Being the report of the Commission, filed December 1, 1906.—This Commission was appointed by Governor Stokes, of New Jersey, in accordance with an act of the Legislature. The object of the Commission was to form plans for the control of the Passaic river during floods in order to protect the city of Paterson and other municipalities along the river from damages. The means recommended for accomplishing this is the construction of a dam at Mountain View to form a reservoir sufficient to contain as much water as ever comes down the river at times of flood. According to estimates prepared by Charles S. Gowen, Consulting Engineer, a dam built to an elevation of 203 feet, holding back water over an area of 8,500 acres and impounding 2,786 million cubic feet of water at a cost of construction of 3,849,359, would accomplish the purpose and would enhance the value of real estate protected to the amount of \$5,128,263. However, if a dam 220 feet high were built, 11,200 acres would be flooded, 15,000 million cubic feet of water would be impounded at a cost of \$7,437,624, and in so doing a supply of potable water available for neighboring cities, New York even, amounting to 200 million gallons a day, could be secured.

State Water Supply Commission, New York, Being the second annual report to the Legislature, dated February 1, 1907.—The volume contains a general review of the work of the Commission, of which Henry H. Persons is President. The report of the Consulting Engineer, Myron S. Falk, contains general statistics and recommendations. A table accompanying the report gives detailed information regarding the water supply of every city or town in the State. Other papers included are: The report of the Consulting Engineer on the application of the City of New York and of other cities and the action of the Commission on these applications; form of application blanks; abstracts of reports of municipalities relating to water supply and sewage disposal; rules and regulations of the Commission; copies of laws; form of public notice of hearing; financial report.

NEWS OF THE SOCIETIES

International Association of Chiefs of Police.—The fourteenth annual convention of the International Association of Chiefs of Police met in Jamestown, Va., June 18. More than 150 delegates were present. Major Richard Sylvester, of Washington, D. C., president of the organization, delivered the opening address. He said in part:

"That it is a 'junket' is not true; for nothing has transpired in the annals of police improvement that has tended to more fully establish a kindred feeling and official co-operation and relationship than these gatherings. The dissemination of information along police lines in this wise and the close individual relationship brought about in this manner strengthen the weaker institution in methods and facilities, and makes stronger the more prominent departments. Nowhere can be found representatives engaged in this cause possessing more fully the attributes to which I have referred than in America, which assertion might be made with greater emphasis, did not the political engine operate as a powerful factor in establishing for them rules of action. In this regard, however, conditions are not as bad now as formerly. The demand for protection that will protect is more earnest than ever before. The disastrous consequences which follow frequent changes in police control and membership, the ill effects which result from these public servants being underpaid, the injustice which ensues from casting adrift those who have given their best years in protecting the lives and properties of others, and who have not been afforded retirement and pensions, are more fully realized by states and municipalities than ever before. This is evidenced by the fact that in forty cities out of ninety pensions are accorded members of the forces on retirement, or to their widows, in cases where the husband has died in the service. The average allowance is half the amount of salary received by the officer while connected with the force. Investigation goes to show, further, that in cities where exists the greatest hazard the lowest amount of pension is paid, or none at all.

"Of the thirty-one municipalities with population exceeding 100,000 each, twenty-five retire members of their police establishments on half pay. This large proportion is exceedingly gratifying and conclusively verifies the claim that there is a growing faith in the police, especially in the larger centers of enlightenment. The records in ninety cities, excluding New York, show that during the year which ended January last eleven policemen were killed and 659 injured. Chicago leading with 208 injured; Baltimore following with 114; Newark with a record of 50; Cleveland fourth, registering 45; and the District of Columbia next, with 35."

The speaker also reviewed the history of the introduction of the Bertillon system in this country and said that it was soon found that to make this system effective its adoption would have to become general. The application of this system, he said, accomplishes much toward the prevention of crime. That is what society wants, not the punishment of those disposed to commit it. Prevention of crime is not difficult when the criminals are known, and those who make up the hardened part of the world live in dread of the light which makes their presence known. The speaker also told of what had been done in the fingerprint method of identifying criminals, saying it had been adopted by the Police Departments of several cities and by the War and Navy Departments. He advised that the system be adopted by every police force in the United States, and continued:

"In the meantime, the Central Bureau of Identification, which has been maintained for the past several years by the enterprising heads of sixty-odd Police Departments in this country, will continue the work of identification, which it has succeeded in bringing to a high standard of efficiency. Its most primary purpose has been to secure from the wardens of the various penitentiaries the names and dates of the discharge of prisoners, together with a brief memorandum in each case, stating the general conduct and demeanor of the individuals during their prison terms. If there has been obedience to the prison rules, an evidence of reform, disposition to industry and manhood on the

part of any of these, the bureau will be prepared to enlighten the police authorities to the end. The Central Bureau, which aims to be the clearing house for all the local bureaus, and the head of which has been schooled in the finger-print system, is conducted on these principles:

"To establish the identity of criminals who would conceal it; to afford the courts information as to the character of criminals, the fact of first offense or mind diseased, that the degree of penalty may be measured; to better acquaint the police with the criminal classes, that they may distinguish between the professional and the novice; to prevent crime through the knowledge the criminal will have that he is known; to enable the police to drive away the criminals before crime is committed; to secure convictions under the habitual criminal laws; to lessen the disposition to commit crime; to acquaint the community with the fact of a criminal's presence therein; to aid in the apprehension of criminals; to aid prison wardens in securing the confidence of prisoners, which must be had to secure reform; to assist in the classification of prisoners, and to prevent concealment of the identification of prisoners who may be confined for a minor offense, while guilty of crime of greater magnitude."

In closing Major Sylvester stated that most cities are inadequately policed and he expressed the hope that adequate forces would be provided and that active duty would be limited to eight hours daily.

Schenectady Chamber of Commerce.—At a meeting June 17 a resolution was unanimously passed providing that the organization become affiliated with the American Civic Association. The local organization will now receive large quantities of printed matter touching on civic organization work and also the reports of the public improvements which are being carried out in other cities. The following members were selected for the Committee on Public Improvements: Hinsdill Parsons, Chairman; Gerardus Smith, D. B. Rushmore, Rev. W. R. Taylor, E. W. Rice, Jr.

The International Association for the Prevention of Smoke.—The second annual convention met at Milwaukee June 26. President John Fairgrieve, of Detroit, was in the chair. Secretary R. C. Harris, of Toronto, reported there were sixty-two members in the association, which embraced sixteen cities. Action will be taken to demand State and National pure air laws on the same plan as the pure food law.

Calendar of Meetings

June 25-27. **Ohio Fire Chiefs' Association.**—Convention, Chillicothe, O.—D. K. Mosher, Secretary, Warren, O.

June 25-27. **North Dakota State Firemen's Association.**—Tournament, Oakes, N. D.—H. L. Read, Secretary, Bismarck.

June 25-28. **American Institute of Electrical Engineers.**—Annual meeting, Niagara Falls, N. Y.—Ralph W. Pope, Secretary, 29 West 39th street, New York City.

June 26-28. **International Association for the Prevention of Smoke.**—Second annual convention, Milwaukee, Wis.—Charles Poetke, Smoke Inspector, Milwaukee, Wis.

July 1-3. **Society for the Promotion of Engineering Education.**—Annual meeting, Cleveland, O.—W. T. Magnider, Ohio State University, Columbus, O.

July 5-6. **Texas Mayors' Association.**—Convention, Amarillo, Tex.—Tom W. Perkins, McKinney, President.

July 8. **American Society of Civil Engineers.**—Annual convention, Mexico City.—Charles Warren Hunt, Secretary, 220 West 57th street, New York City.

July 15-17. **International Acetylene Association.**—Convention, Washington, D. C.—L. S. Bigelow, 265 Broadway, New York, Secretary.

July 16-18. **Illinois State Firemen's Association.**—Tournament, Kewanee, Ill.—Walter E. Price, Champaign, Ill., Secretary.

July 17-19.

National Electrical Contractors' Association.—Seventh annual convention, New York City.—J. C. Hatzel, Chairman, 571 Fifth avenue, New York, N. Y.

July 29-Aug. 1.

South Carolina State Firemen's Association.—Convention and tournament, Anderson, S. C.—R. S. Hood, Sumter, S. C., Secretary.

July 29-30.

Western New York Firemen's Association.—Convention and tournament, Batavia, N. Y.—Charles F. Foley, Lockport, N. Y., Secretary.

July 30-31.

Illuminating Engineering Society.—First annual meeting, Boston, Mass.—Dr. A. H. Elliott, Secretary, 4 Irving place, New York City.

August 6-8.

American Association of Park Superintendents.—Annual convention, Toronto, Ont.—F. L. Mulford, Secretary, Harrisburg, Pa.

August 7-9.

The International Association of Municipal Electricians.—Annual convention, Jamestown Exposition, Norfolk, Va.—F. P. Foster, Secretary, Corning, N. Y.

August 20-23.

New York State Firemen's Association.—Convention, Elmira, N. Y.

September 11-13.

New England Water Works Association.—Annual convention, Springfield, Mass.—William Kent, Secretary, Narragansett Pier, R. I.; Office, Tremont Temple, Boston, Mass.

September 17-19.

American Society of Municipal Improvements.—Annual convention, Detroit, Mich.—George W. Tillson, Secretary, 13 Park Row, New York City.

September 17-19.

League of Iowa Municipalities.—Tenth annual convention, Council Bluffs, Iowa.—T. G. Pierce, Secretary, Marshalltown, Ia.

September 19-21.

League of American Municipalities.—Annual convention, Jamestown Exposition.—John MacVicar, Secretary, Des Moines, Ia.

October 8-11.

International Association of Fire Engineers.—Thirty-fifth Annual Convention, Washington, D. C.—James McFall, Secretary, Roanoke, Va.

October 14-18.

American Street and Interurban Railway Association.—Annual convention, Atlantic City, N. J.—B. V. Swenson, Secretary, Engineering Societies Building, 33 West Thirty-ninth street, New York.

November 19.

National Municipal League.—Annual convention, Providence, R. I. (in conjunction with the American Civic Association).—Charles Y. Bonaparte, Secretary.

CIVIL SERVICE EXAMINATIONS

Assistant Engineer, Board of Water Supply.—The Municipal Civil Service Commission, 299 Broadway, New York City, will receive applications until July 11 for the position of Assistant Engineer, Board of Water Supply. The examination will be held July 31, at 10 A.M. Usual requirements as to residence in New York State are waived. The salary is \$1,350 per annum and upwards. For further information address the Board of Water Supply, 299 Broadway, New York City.

Electrical Engineer and Draftsman.—The United States Civil Service Commission announces an examination July 17, 18, 19, to secure eligibles to fill a vacancy in the position of electrical engineer and draftsman in the Supervising Architect's Office. Salaries ranging from \$1,200 to \$1,600 per annum.—Apply on Form 1312.

Dairy Chemist.—The United States Civil Service Commission announces an examination, July 10, to secure eligibles to fill a vacancy in the position of assistant in dairy chemistry in the Bureau of Animal Industry, Department of Agriculture. Salaries, \$1,200 to \$1,600.—Apply for Form 304.

Topographical Draftsman.—The United States Civil Service Commission announces examinations, July 10-11, to fill vacancies in the position of topographical draftsman and copyist topographical draftsman. Salaries, \$900 to \$1,500.—Apply on Form 1312.

Dairy Bacteriologist.—The United States Civil Service Commission announces an examination, July 10, to secure eligibles to fill vacancies in the position of assistant in dairy bacteriology in the Bureau of Animal Industry, Department of Agriculture. Salary, \$1,200 to \$1,600 per annum.—Apply on Form 304.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Municipal Interest

DIVERSION OF STREAM

Stevens vs. Worcester.—George A. Stevens, owner of a mill on the Blackstone river, is to recover judgment for \$7,812 against the city of Worcester for the diversion of water from his mill. His mill is operated by water from the river. Of late years he has lost the use of water that should naturally have come to his mill by the fact that the city, in connection with its sewerage system, has diverted the water of Mill brook, a tributary of the Blackstone river. The city had claimed it was not liable in damages to him for the diversion upon the ground that the Legislature had authorized it, but the court decides it had no right to divert the water from his mill.—Supreme Judicial Court of Massachusetts.

ELIGIBILITY TO OFFICE

Sory vs. Isaac M. Vickers, Mayor.—The appellee Sory was elected Councilman of the city of Madisonville. Subsequently he was appointed to the office of member of the County Board of Health, accepted the appointment and discharged the duties of his office. Whereupon the Mayor of Madisonville refused to recognize him longer as a member of the Town Council and proceeded to fill the vacancy in his office. The statutes provide that no person shall fill a municipal and a county office. A member of a County Board of Health is an officer within the meaning of the statutes. The Circuit Court was accordingly held to be in error in granting a mandamus to compel the Mayor to recognize the appellee as Councilman.—Court of Appeals of Kentucky.

VALIDITY OF BONDS

Town of Lumberton vs. John Nuveen & Co.—The proceedings were brought to determine the legality of an issue of bonds to the amount of \$25,000 issued by the town of Lumberton, which the defendants had contracted to furnish. The defendants contested the validity of the bonds on the ground that the petition and notice of election did not set forth with certainty the rate of interest or time of maturity. The notice did state that the interest should not exceed 6 per cent., and the court held that that sufficiently set forth the rate of interest. The time of maturity of the bonds was stated to be not over thirty years, but that they might be redeemable in twenty years. The notice was held to be sufficient on this point also. It was further contended that the rate of taxation levied by the plaintiff's commissioners in their order was insufficient to provide annual interest and a sinking fund. The plaintiff requested the court to take judicial notice that the town was growing rapidly and accordingly would be able to provide for the fund payments even at a lower rate of taxation than they had now. The court refused to take this judicial notice, but held that if the taxes were not sufficient the authorities would have to make them so. Regarding the objection raised that water works and sewerage bonds should have been voted on separately, it was held that it was unnecessary to determine whether water works and sewerage are one and the same thing, as understood in the town of Lumberton, or are two distinct fields of municipal improvement. Accordingly it was held that the bonds constituted a valid obligation of the town.—Supreme Court of North Carolina.

MUNICIPAL RESPONSIBILITY—DUMPING ASHES

Johnson vs. City of Somerville.—The plaintiff complained that his cellar was flooded because of ashes being dumped into a water course on a lot of land owned by the heirs of Mary C. Gurney. It appeared that the water course in question was a brook which ran dry in summer. There was evidence that when it ran dry a mudhole of stagnant water was left on the premises in or near its course. The record of the Board of Health showed that a vote had been taken to the effect that the brook must be drained to the sewer. The dumping of ashes had been going on four years; the plaintiff knew it and did not protest. The Superintendent of Collection of Ashes, on being called, stated he dumped ashes there because it was convenient. The Board of Health denied that ashes were dumped there by its orders. The court held that the decision of a city to engage in the removal of ashes within its limits is not a Legislative act and need not be sig-

nified by an ordinance, but may be proved by evidence. That the liability of a city engaging in the removal of ashes within its limits for injuries to third persons is the same, whether the injuries are caused by the negligence or by the intentional acts of the person in charge of the work. That for non-performance of a public duty, resulting in damage to an individual, no action lies against the municipality, or against the person on whom the public duty is put. That where a tortious act complained of is done by a town or city in pursuance of the vote of the inhabitants in town meeting, or in pursuance of a vote of the Council, the town and city respectively are liable. That when a tortious act complained of is done by a public officer personally, or by someone in his presence and under his personal direction, the public officer is personally liable. That the liability of a municipality, as owner of land or a building, is the same as that of a natural person. That when work to be done is public work, the relation of master and servant does not exist between the employee and the person who selects the employee, nor between the employer and the public agency which pays the employee out of public funds. That a city performing a public duty directly placed on it, though possessing, not only full power in the employment of men to perform the work, but also power to prescribe the duties of the employees and the terms on which they shall work, is not liable for an injury to an individual occasioned by the employee engaged in doing the work, whether he acts negligently or intentionally. That a city is not liable for injuries to a third person, caused by its Superintendent of Collection of Ashes dumping ashes into a water course on the land of an individual adjacent to the land of the third person, when the dumping was not in pursuance of an order of the City Council, and when it was done by the Superintendent in the performance of a public duty, from which the city derived no private benefit.—Supreme Judicial Court of Massachusetts.

JOINT SUIT OF PROPERTY OWNERS

Gill et al. vs. City of Lake Charles.—The city of Lake Charles is situated on the shore of Lake Charles. An ordinance granted the St. Louis, Watkins and Gulf Railway a franchise giving it the right and power to construct and operate a steam railroad along the lake front. The plaintiffs were citizens and taxpayers of the city and owners of property abutting on the lake as well as the riparian rights. The so-called Front street had never been dedicated or expropriated as a street and at best it was but an easement by the owners for passage on foot and for ordinary vehicles. Claiming that the adoption of the ordinance was an abuse of power and was null, the petitioners protested against the action. The city and the railroad company were made defendants. The defendants excepted that there is no allegation of priority of interest between the plaintiffs and that therefore there is a misjoinder of parties plaintiff. The lower court sustained the exception and the plaintiff appealed. The court held that as the code makes no provision for determining when parties may or may not be joined in a suit, that rules of pleading, as found in books of common law, obtain and a large discretion is left to the court; the aim should be to avoid a multiplicity of suits. The court held that taxpayers may join in one suit for the purpose of preventing the illegal disposition of property by the municipality, so may property owners along a street, to prevent an obstruction of the street; so they may for the purpose of contesting the right of a municipality to grant to a railroad company along a so-called street in which they have a common interest.—Supreme Court of Louisiana.

BUILDING LAWS—NUISANCE

State vs. Withnell.—An ordinance of the city of Omaha provides that before constructing any building to be used for manufacture or storage of gas the party desiring such privilege shall first obtain the written consent of all the property owners within a radius of 1,000 feet of the proposed structure, and file such permission with the building inspector. The charter of the city gives the Mayor and Council authority to regulate and prohibit the storage of explosive articles. The gas company of the city, wishing to build a gas tank, complied with all the conditions of the ordinance, except that they did not file the consent of the property owners with the city officials. The constitutionality of the ordinance was questioned in mandamus proceedings to compel the city to grant the permit, on the ground that it was prohibitory on account of the impossibility of procuring the unanimous consent of all the owners of property in any locality of the city, and because the ordinance assumes to confer upon individual property owners absolute and arbitrary powers. The court adopted the arguments of the gas company and held the act unconstitutional, as an unlawful delegation of power.—Supreme Court of Nebraska.

PERSONALS

BINGHAM, R. W., Louisville, Ky., has been appointed by Governor Beckham, of Kentucky, as Mayor of Louisville, succeeding Mayor Paul C. Barth, who was deposed by a decision of the Court of Appeals.

BLAKESLEE, HENRY J., of Utica, N. Y., Electrical Inspector for the State Board of Underwriters, has filed papers with the Municipal Civil Service Commission, of Syracuse, N. Y., for the position of Superintendent of the Bureau of Gas and Electricity, recently created by the Legislature, and will probably be appointed to the position.

FITZGERALD, JOHN F., Mayor of Boston, Mass., has issued an appeal to citizens to make the week of July 28 a holiday, when the Hub will inaugurate "Old Home Week," which has become an institution in many New England cities and towns, and for which the city government has made a \$25,000 appropriation.

GILLETTE, MAJ., CASSIUS E., who resigned his commission in the Engineer Corps, U. S. Army, to become Chief Engineer of the Bureau of Filtration during the political upheaval in Philadelphia, Pa., under Mayor John Weaver, and relinquished the office on the advent of Mayor John E. Reyburn, has opened a consulting engineering office at 1031 Land Title Building, Philadelphia, Pa.

HERING, RUDOLPH, New York City, Consulting Engineer, received the degree of Doctor of Science at the recent annual commencement of the University of Pennsylvania.

HOWE, FREELAND, JR., Chemist and Bacteriologist of the Laboratories at Norway, Me., will take charge of the water supply at Bangor, Me., which is now treated by mechanical filtration, and will probably recommend that the filter plant be remodeled and a sedimentation basin added, having consulted George W. Fuller, M. Am. Soc., C. E., of New York City, on the matter.

HUSTON, R. C., formerly Consulting Engineer of the City of Hattiesburg, Miss., and W. S. Fuller, City Engineer, have become associated as the Huston Engineering Company, with offices at 613 Machica Building, New Orleans, La., and will do general engineering and construction work.

McMOORE, H. A., Engineer, formerly with the Harlem Contracting Company, of New York City, has been engaged by the General Fireproofing Company, and is at present located at the home office and works in Youngstown O. He will be connected with the Reinforced Concrete Department.

REYBURN, JOHN E., Mayor of Philadelphia, Pa., recently went to Washington, D. C., with a party of friends and made the trip to his home town aboard his yacht, the Gretchen, which has been anchored in the Potomac since the Mayor's term in Congress. It is his intention to make short cruises during the summer months, provided the duties of his office prevent him from taking an extended vacation.

SCHAEFER, H. F., has been appointed Assistant Engineer of the Sewerage Commission of Baltimore, Md.

SCHADT, LEANDER, City Engineer of Cumberland, Md., has been reappointed.

SCHMITZ, EUGENE E., Mayor of San Francisco, has been formally removed by the Supervisors and Supervisor Gallagher named as Acting Mayor. He was removed on the ground that owing to his incarceration in the county jail under a felony conviction, he is no longer able to perform his duties. Judge Lawlor recently released Mayor Schmitz from the county jail from 11 to 4 o'clock to consult his attorneys and to transact other business.

SCHNAUBER, FRANK J., formerly City Engineer of Syracuse, N. Y., and a Consulting Engineer, was the only applicant filing papers with the Municipal Civil Service Commission for the position of Engineer to the Syracuse Park Commission, which place he has been filling by temporary appointment.

SHOCKLEY, H. M., of Pablo Beach, Fla., is the first Mayor of this newest municipality in the Everglade State. J. Denham Bird is Treasurer and G. W. Wilkinson Clerk. City Councilmen: J. E. Dickerson, E. E. Williard, William Wilkerson, E. E. Suskind, Alex. Stevens, W. H. Shutter, C. M. Greiner, T. H. Griffith and Chas. H. Mann.

SCHUNK, HENRY, Mayor of Dubuque, Ia., disappeared recently without notice, and his whereabouts were a mystery for several days until he was located in New Mellary Abbey, the home of the Trappist Monks, near Dubuque, where he had gone to seek absolute rest.

SWEARINGEN, C. W., City Engineer of Great Falls, Mont., has been reappointed.

TURNER, O. A., City Engineer of Phoenix, Ariz., has been reelected.

WELLS, C. G., City Engineer of Galveston, Tex. has resigned, and A. S. Drewery has been elected Superintendent of Water Works, E. J. Owin, Chief Engineer of the Sewerage Department, and W. T. Scudder Assistant City Engineer.

WHIPPLE, GEORGE C., and James H. Fuertis of New York City, R. S. Lea of Montreal, and J. E. Schwetzer of Winnipeg have been appointed a Board of Consulting Engineers to investigate upon a new water supply for Winnipeg, Canada.

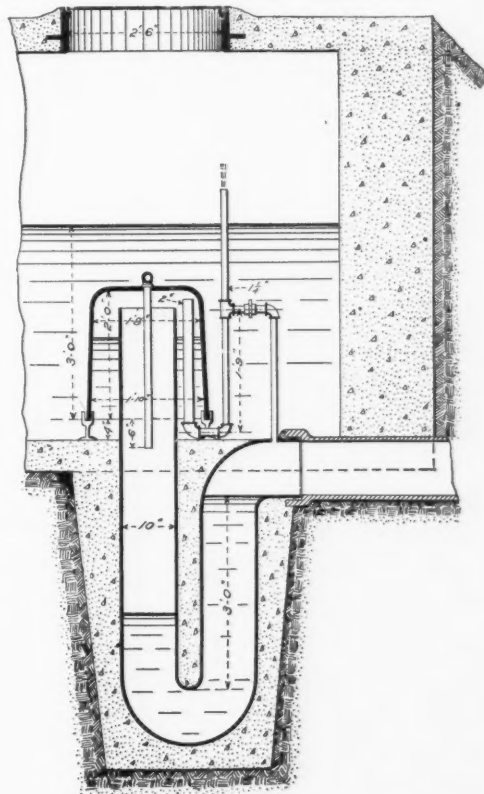
TRADE NOTES

Suburban Cars.—The Barney & Smith Car Manufacturing Company, Dayton, O., have designed and completed a steam power car for the Erie Railroad which it is believed will enable them to compete successfully for interurban traffic. The car is about fifty feet long, equipped with a steam engine in the front vestibule, the engine being an importation from Australia. The Erie has kept its plans secret; its employees were cautioned and they worked behind closed doors. The first trial of the car was made at night.

Cast Iron Pipe.—The United States Cast Iron Pipe and Foundry Co., Jersey City, N. J., has issued its annual report for the year ending May 31. The company's total income amounted to \$2,112,051, an increase of \$58,843 over the previous year. The balance sheet showed total assets of \$31,240,844, as compared with \$30,494,354 at the close of the previous year. During the year the company built a new foundry in Chattanooga, a complete new foundry in Scottsdale, near Pittsburg, and a foundry and power house in Burlington.

Electrical Apparatus.—The Crocker-Wheeler Company, manufacturers and electrical engineers, Ampere, N. J., announce that they have opened a sub-office in the Columbus Savings and Trust Building, Columbus, O. The sub-office will be in charge of Charles W. Cross, formerly of the Cleveland office of the Crocker-Wheeler Company.

Flush Tank for Disposal Plants.—While the Pacific Flush Tank Company's products have been used very exclusively throughout the country for the automatic flushing of sewers, their use in connection with disposal plants is not so generally known. For this purpose there may be used either the ordinary tanks or a modification thereof by which alternating siphons are formed, from two to six or even more siphons being employed in the same tank. These are used in what is known as a dosing tank, the function of which is to accumulate a sufficient quantity of sewage to cover one of the beds to a depth of two to four inches, and the siphons are made large enough to convey the sewage on to each bed very rapidly, thus flooding the entire surface. The automatic apparatus supplied for this purpose consists of the Miller-Adams double or triple or the Miller or the Pacific plural alternating siphons, according to the number needed. None of the alternating siphons has any moving part. In the more recent design no portion of the pipe connecting the siphons is buried in the concrete or walls, and all of it can be taken apart at will, a very important feature. When required the siphons can be made adjustable, so that the drawing depth of liquid in the dosing tank may be varied, this being desirable in some instances. The illustration shows the section of one of a pair of Miller-Adams double alternating 10-inch siphons.



Section C-D

FLUSH TANK FOR DISPOSAL PLANT

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we can not guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Street Improvements				
Tennessee	Johnson City	July 4, noon	Paving 6 sts., any material, curb, sewers, etc.	E. E. Ellsworth, Recorder.
Virginia	Emporia	July 4, 8 P.M.	Laying, etc., 2,400 sq. yds. cement walks.	John R. Grizzard, Town Clerk.
Indiana	Brazil	July 5, 11:30 A.M.	Constructing mile gravel road Cass twp.	James L. Burns, Co. Auditor.
Ohio	Lancaster	July 5, noon	Laying 1,100 sq. yds. brick sidewalks.	Geo. Cunningham, Clk. B. P. S.
Ohio	Cincinnati	July 5, noon	Improving Ohio pike, Anderson township.	Fred Dreihls, Clk. Co. Comrs.
Indiana	Valparaiso	July 5	Paving with vit. brick, comb curb and gutter, 2 streets, also widening, etc., macadam roads.	Robert B. Ewing, City Clerk.
New Hampshire	Concord	July 5	Grading and surfacing with broken stone, 3,500 ft. road in 2 towns.	A. W. Dean, State Engineer.
New York	New York	July 5	Granite paving, etc., Chelsea Sec. North R'v'r.	Commissioner of Docks.
New Hampshire	Nashua	July 5	Building 2 miles of macadam road.	A. W. Dean, Concord, State Eng'r.
New Hampshire	Milton	July 5	Constructing macadam road.	A. W. Dean, Concord, State Eng'r.
New Hampshire	Farmington	July 5	Constructing macadam roads.	A. W. Dean, Concord, State Eng'r.
Indiana	Newport	July 6, 10 A.M.	Bldg. 2 gravel roads, 22,000 ft. long.	H. T. Payne, County Auditor.
Ohio	Wooster	July 6, noon	Paving 11,230 yds. vit. brick on stone curb/g. 6,200 ft. straight and 222 ft. curved curb/g.	J. L. Eberhardt, City Engineer.
Ohio	Wapakoneta	July 6, 1 P.M.	Grading, graveling, etc., 2 roads, 7,805 ft. long.	Comrs. Anglaize and Allen Co's.
Arkansas	Pine Bluff	July 6, 2 P.M.	Brick paving 17,000 sq. yds. combined curb and gutter, 8,000 ft. Second Avenue.	Wm. J. Parkes, City Engineer.
Washington	Seattle	July 6	Regrading 3d Ave., Denny Hill, cost, \$700,000.	C. B. Bragley, Secy. Bd. Pub. Wks.
New Jersey	Cape May	July 8, 10 A.M.	Bldg. 3.455 miles State and County road.	County Freeholders.
New Jersey	Ocean City	July 8, noon	Building 3.455 miles of road.	R. Fendall Smith, Engineer.
Indiana	La Porte	July 8, 5 P.M.	Paving 2 alleys with brick.	Walter Baker, City Clerk.
Pennsylvania	Clarion	July 8, 7:30 P.M.	Paving 16,780 sq. yds., grading 6,200 cu yds., curbing, 0.085 lin. ft., Wood and Main Streets.	James Rutherford, Engineer.
New Jersey	Salem	July 8, 8 P.M.	Grading and laying oyster shell or gravel on 4 miles of Quinton and Aldine roads.	J. F. Ayers, Director Freeholders.
Wisconsin	Sturgeon Bay	July 8	Grading macadam 0.000 yds., etc., 5 streets.	City Engineer.
Ohio	Pleasant Ridge	July 8	Bldg. artificial stone sidewalks.	W. C. Davies, Clk. Village Council.
Minnesota	Duluth	July 8	Bldg. 3-mile extension to Lavel Road.	County Commissioners.
Pennsylvania	Clarion	July 8	Paving 16,780 yds.; curb, 0.085 ft., grade 6,200 yds.	G. G. Sloan, Boro. Clerk.
Ohio	Pleasant Ridge	July 8	Bldg. artificial stone walks on many streets.	W. C. Davies, Village Clerk.
Delaware	Wilmington	July 9, 10:30 A.M.	Bldg. 9 macadam roads; 21.42 miles.	Francis A. Price, Co. State H'w'y Com'r.
Ohio	Wadsworth	July 9	Grading, curbing, paving, etc., High St.	P. S. Goss, Village Clerk.
New York	New York	July 9	Supplying 4,000 lbs. Val de Travis, 5,000 lbs. Trinidad, 18,000 lbs. Trinidad asphalt or paving cement.	Bureau Supplies and Accounts, Navy Dept., Washington, D. C.
Ohio	Steubenville	July 9	Constructing State highway.	Sam Huston, Columbus, Comr.
Ohio	Steubenville	July 9	Constructing macadam road.	County Commissioners.
Ohio	Cambridge	July 9	Constructing State highway.	Sam Huston, Columbus, Comr.
New Jersey	Atlantic City	July 10, 11:30 A.M.	Graveling road to County line.	E. D. Rightmire, County Engineer.
New York	Albany	July 10, noon	Repairing 8 roads in Albany County.	Fred'k Skene, State Engineer.
Ohio	Cincinnati	July 10, noon	Grading, paving, etc., Graddin road; cost, \$21,988.	M. J. Keefe, Clk. Bd. Pub. Service.
Ohio	Lancaster	July 10	Constructing 1,100 sq. yds. brick sidewalk.	Geo. Cunningham, Clk. B. P. S.
Indiana	Indianapolis	July 10	Asphalt paving, cement walks, etc. sev'l sts.	Jos. T. Elliott, Pres. B. P. W.
New York	Moravia	July 10	Paving Central St. with brick on concrete.	Guy Hilliard, Clk. Village Bd.
New York	Brooklyn	July 10	Cement walk, 78,300 yds.; curb, 10,010 ft.; earth exc., 7,060 yds.	Bird S. Coler, Boro. President.
Ohio	St. Bernard	July 10	Macadamizing Sullivan Ave., etc.	Geo. Schroeder, Village Clerk.
Ohio	St. Clairsville	July 10	Constructing 2 State highways.	Sam Huston, Columbus, Comr.
Indiana	Sullivan	July 11, noon	Bldg. macadam road, 10,933 ft. long.	E. E. Russell, County Auditor.
South Carolina	Charleston	July 11, noon	Furnishing creosoted lumber and rubble stone.	Capt. G. P. Howells, Eng'r Corps.
Ohio	Elyria	July 12	Grading and macadamizing two roads.	Chas. Chandler, Clk. Co. Comrs.
Michigan	Hudson	July 12	Paving 9,000 sq. yds. curb, drainage, etc.	Riggs & Sherman, Toledo, O., Engrs.
Indiana	Petersburg	July 12	Building 7,558 ft. of gravel road.	F. R. Bilderblack, Co. Auditor.
Ohio	Cincinnati	July 12	Improving Springfield pike, Glendale.	Fred Dreihls, Clk. Co. Comrs.
Virginia	Balls Bluff	July 13, 11 A.M.	Constructing government roadway.	M. Gray Zalinski, Q. M. U. S. A., Washington, D. C.
Wisconsin	Racine	July 13	Brick paving and concrete curb.	P. H. Connelly, Clerk of Board.
Ohio	Cleveland	July 13	Grading and draining Taylor road.	A. B. Lea, County Engineer.
Wisconsin	Green Bay	July 15, 10 A.M.	Paving with asphalt, grading, etc.	John Gross, Chm. St. Com.
Ohio	Cincinnati	July 15, noon	Pave, grade, etc., Beechmont Ave.; cost, \$90,766.	Chas. N. Danenhowe, City Eng'r.
Ohio	Wauseon	July 15	Paving Depot St. with brick on concrete.	H. L. Deyo, Village Clerk.
Ohio	Cleveland Heights	July 16, noon	Grading, paving, etc., Mayfield road.	Wm. G. Phare, Village Clerk.
Washington	Snohomish	July 16	Grade, curb, cement walks; 4th St.; cost, \$30,000.	City Council.
Ohio	Chardon	July 16	Constructing a State highway.	Sam Huston, Columbus, Com'r.
Ohio	Cincinnati	July 16, noon	Grading and metalizing pike, bldg. culvert, etc.	Stanley Struble, Pres. Co. Comrs.
Ohio	Columbus	July 19	Constructing roads, pavements, etc., Bar'cks.	H. B. Chamberlain, Q. M. U. S. A.
Ohio	Findlay	July 20, noon	Bldg. 3 miles stone pike; also 3-4 mile.	Isaac Hart, County Com'r.
Indiana	Crawfordsville	July 20, 3 P.M.	Bldg. Co. Line gravel road, 8 miles, \$20,000.	Board County Commissioners.
Indiana	Greencastle	July 20	Grading, macadam, etc., County line.	Clement C. Hurst, Co. Auditor.
Wisconsin	Oshkosh	July 20	Asphalt paving, comb. curb and gutter.	W. A. Marden, Clk. Bd. Pub. Wks.
Louisiana	New Orleans	July 24, 1 P.M.	Repair artificial walks, Anunciation Sq.	W. J. Hardee, City Engineer.
New Jersey	Camden	July 25	Paving streets on concrete base.	Edw. Pransie, Chm. Com.
Indiana	Green Castle	August 1	Bldg. 5 1/2 miles gravel and macadam road.	C. C. Hurst, County Auditor.
Pennsylvania	Reynoldsville	August 6	Grading, curbing and paving Swamp Alley.	J. C. King, Pres. Town Council.

Water Supply

New York	New York	July 3, 2 P.M.	Furnishing c. i. pipe, castings and hydrants.	John H. O'Brien, Water Comr.
Michigan	Owosso	July 5, 10 A.M.	Sinking well, furnishing pipes, machinery, etc.	Board of Public Works.
Nebraska	Grand Island	July 6, 5 P.M.	to deliver into reservoir 1,500,000 gals.	H. E. Clifford, City Clerk.
Ohio	Norwood	July 6	Laying 7 blocks 6-in. c. i. pipe, hydrants, etc.	Jas. A. Stewart, Cincinnati, Engr.
Nebraska	Grand Island	July, 7 5 P.M.	Extending mains, 7 sts., 4,300 ft. 4-in., 1,100 ft. 6-in. pipe, ton specials, etc.	H. E. Clifford, City Clerk.
Oklahoma	Pawhuska	July 8, 8 P.M.	Laying 2,408 ft. 6-in. c. i. water pipe, \$2,630.44.	C. T. Bennett, City Clerk.
New York	Yonkers	July 8, 8 P.M.	Engineering work, designing water system, etc.	J. J. Devitt, Pres. Water Comrs.
Minnesota	Hastings	July 8	Laying 3,400 ft. 8-in. pipe, hydrants, etc.	Charles Hawkes, City Clerk.
South Dakota	Highmore	July 8	Constructing water mains in 6 streets.	E. C. Ericson, Vermillion.
Ohio	Carthage	July 8	Equipping well, State Experimental Farm.	John Kuderer, Secy. Bd. Pub. Affrs.
New York	East Hamburg	July 8	Sinking 10-in. well, complete.	J. W. Ledoux, Phila., Pa., Engr.
Pennsylvania	Philadelphia	July 8	Constructing 10,000,000 gal. dis. reservoir.	Geo. R. Stearns, Dir. Pub. Wks.
Pennsylvania	Etna	July 8	Feed water heater, breeches and flange pipe, extending injection pipe, etc., pumping stations.	A. R. Dunbar, Boro. Clerk.
Missouri	Jackson	July 9, 7:30 P.M.	Laying 4,135 ft. 8, 6, 4-in. c. i. pipe, 3 streets.	Hiram Phillips, St. Louis, Con. Engr.
New York	Iowa Island	July 9	Complete water and light plant.	Navy Dept., Washington, D. C.
Illinois	Chicago	July 10, 11 A.M.	Supplying pipe, fittings, etc., Naval Mag. Bldg. foundation, Lake View pumping station, inc. caissons, rein. concrete walls, and floor, gate shaft and gates, suction wells and funnel connections.	John J. Hanberg, Com'r Pub. Wks.
Ohio	Columbus	July 10, noon	Laying c. i. force mains, inc. 10,100 yds. excavation, 12,200 yds. embankment, 2,200 yds. macadam, 495 yds. brick and concrete masonry, 2,554 tons c. i. pipe and castings, 26 3 to 36-in. gate valves, 21,000 lbs. mis. iron and steel.	E. F. McGuire, Secy. Bd. Pub. Ser. Park Commissioner.
Indiana	Indianapolis	July 12	Laying water pipes in Riverside Park.	Ira W. Sylvester, Alexandria, Consulting Engineer.
Louisiana	Eunice	July 15, 6 P.M.	Constructing waterworks system.	Emil H. Klamp, Village Clerk.
Wisconsin	North Milwaukee	July 15, 8 P.M.	Furn. and laying 12,000 ft. c. i. pipe, hydrants, etc.	A. G. Engdahl, City Auditor.
North Dakota	Kenmore	July 15	Constructing 1,125 ft. 14-in. water main.	Burns & McDonnell, Kansas City, Mo.
Oklahoma	Sayre	July 16, 3 P.M.	Furn. material and building water works, inc. pumping machinery, pipes, valves, etc., steel tower 100 ft. high, 50,000-gal. tank.	Oscar Erickson, Pres. Village Com.
Minnesota	Comfrey	July 16	Bldg. water works plant, complete.	H. Schulz, Capt. Engrs. U. S. A.
Minnesota	St. Paul	July 20, 11 A.M.	Rebuilding Sandy Lake Reservoir dam.	E. S. Millard, City Clerk.
Nebraska	Randolph	July 22	Laying 5,000 ft. 4-in., 1,500 ft. 6-in. c. i. main, etc.	The Mayor.
Wisconsin	West Bend	July 24	Erecting water system, complete.	Willis Chipman, Toronto, Engr.
Saskatchewan	North Battleford	July 31	Installing, etc., water works, etc.	M. J. Desmond, Clk. Bd. Trus.
California	Sacramento	August 19, 8 P.M.	Competitive plans and specifications for constructing filtration plant.	Geo. G. Earl, Gen. Supt. S. & W. Bd.
Louisiana	New Orleans	September 4, 3 P.M.	Hauling and laying 250 miles 4 to 30-in. c. i. water pipe, aggregating 26,000 tons.	

Sewerage

Tennessee	Johnson City	July 4, noon	Laying 5,800 ft. 8 in. lateral sewers, 5,000 ft. trunk sewer, tile or concrete, etc., 6 streets.	E. E. Ellsworth, Recorder.
Alabama	Ensley	July 4	Laying 42- to 66-in. storm sewers, several sts.	City Clerk.
Pennsylvania	Harrisburg	July 5, 2:30 P.M.	Constructing reinforced concrete sewer, etc.	E. E. Ellsworth, Secy. Bd. Pub. Works
Michigan	Mt. Clemens	July 5	Bldg. brick sewer, Market St., 3.25-4.25 ft.; also one 3- and 4-ft., Church St.	Winifred Ferrin, Dept. City Clk.
South Dakota	Madison	July 8, 8 A.M.	Sewer system for Normal School buildings.	Regents of Education, Aberdeen.
District of Columbia	Washington	July 8, noon	Constructing sewers, per specifications.	Jay J. Morrow, Engr Com'r.
Iowa	Independence	July 8, 7:30 P.M.	Constructing sanitary sewer.	The Mayor.
Oklahoma	Pawhuska	July 8, 8 P.M.	Eng. work designing, etc., sewer system, etc.	C. T. Bennett, City Clerk.
Wisconsin	Sturgeon Bay	July 8	Union St. sewer, 1,025 ft. 12-15-in. pipe; also 2 laterals, 700 ft. 12-in. pipe, etc.	A. C. Greaves, City Engineer.
Iowa	Waverly	July 8	Furn. and laying 3,300 ft. 24-in. vit. pipe.	F. H. Munger, City Clerk.
Ohio	Youngstown	July 8	Constructing sewers in three streets.	W. H. McMillen, Clk. Bd. Pub. Serv.
Iowa	Harlan	July 8	Laying 8-in. vit. glazed pipe sewer, sev'l sts.	James C. Byers, Mayor.
Ohio	Napoleon	July 8	Laying storm sewer, Mary Dodd's 2d Ad.	W. O. Hudson, City Engineer.
Minnesota	Hastings	July 8	Constructing sewers in 6 streets.	City Engineer.
Minnesota	Elbow Lake	July 8	Constructing sewers and a septic tank.	Loweth & Wolff, St. Paul, Engrs.
South Dakota	Vermillion	July 8	Building sewer system at Normal School.	Secretary.
New York	New York	July 9, noon	Temporary sewers.	Geo. Cromwell, Pres. Boro. Richm'd.
Ohio	Columbus	July 10, noon	Furnishing and erecting 2 units for pumping sewerage, each 2,900,000 gals., against head 63 ft., piping, etc., and 20-in. Venturi meter.	E. F. McGuire, Secy. Bd. Pub. Serv.
Pennsylvania	Cresson	July 10	Proposed sewers, to cost \$9,000.	Fred W. Hamburger, Ebensburg.
Kansas	Eldorado	July 12	Extending sanitary sewer system, inc. 8,500 ft. 8-in. pipe, 17 manholes, 6 flush tanks.	B. F. Allenbach, City Clerk.
Ohio	Norwood	July 13	Bldg. sanitary sewer, inc. 10,000 ft. 8-21-in. pipe, 25 tons iron pipe, manholes, etc.	L. H. Gerhart, City Clerk.
Ohio	Steubenville	July 15, noon	Laying 12-in. pipe sewer in Alley D.	T. W. Vance, Clk. Bd. Pub. Serv.
South Dakota	Brookings	July 15, 8 P.M.	Constructing sewer system: 60,698 ft. 24-8-in. pipe, septic tank and 3 filter beds.	F. M. Cappellen, Minneapolis, Minn.
New Jersey	Elizabeth	July 15, 8:30 P.M.	Laying 10-in. pipe sewer, etc.	N. K. Thompson, St. Com'r.
Ohio	Cleveland Heights	July 16, noon	Constructing sewers in Taylor's road.	Wm. H. Evers Eng. Co., Cleveland.
Connecticut	Torrington	July 16, 2 P.M.	Constructing 20,580 ft. 20-8-in. tile pipe sewer, 76 manholes, etc.	Walter A. Williston, Boro Engr.
Ohio	Columbus	July 16	Bldg. Burkett Co. ditch, Brown twp.	Walter Braun, Co. Surveyor.
Ohio	Medina	July 16	Bldg. sewers and disposal works, Dists. Nos. 1 and 2, inc. 1,325 ft. 15-in., 115 ft. 12-in., 31,300 ft. 8-in. pipe, etc.	E. G. Bradbury, Columbus, Engr.
Ohio	Bucyrus	July 19	Bldg. sewage disposal plant, inc. filter beds, and concrete work, Co. Infirmary.	Chas. Meyer, Clk. Bd. Directors.
Florida	Pensacola	July 20, 11 A.M.	Bldg. sewer system at navy yard.	Commanding Officer.
Ohio	Willoughby	July 22	Building a sanitary sewer.	C. C. Jenkins, Village Clerk.
Indiana	Frankfort	July 25, 2 P.M.	Constructing a sanitary sewer.	Worth Price, City Clerk.
Saskatchewan	North Battleford	July 31	Installing, etc., sewer system, etc.	Willis Chipman, Toronto, Engr.
Ohio	Piqua	August 1	Quantity of 24- and 34-in. sewer pipe.	W. B. Mitchell, Clk. Bd. Pub. Ser.
Louisiana	Alexandria	August 6	Constructing about 5 miles 10-, 12-, 14-in. tile pipe, sewers and accessories.	Ira W. Sylvester, City Engr.

Public Buildings

Michigan	Kalamazoo	July 5, 9 A.M.	Erecting Central Fire Station.	F. D. Van Volkenburg, Architect.
Iowa	Spring Hill	July 5	Erecting school house.	J. H. Barle, School Board.
Iowa	Dunkerton	July 5	Erecting public school building.	J. P. Page, Pres. Bd. Educ.
New Jersey	Jersey City	July 5	Additions, etc., Contagious Disease Hospital.	Henry Smellie, Health Officer.
Oklahoma	Frederick	July 5	Erecting 2-story brick school.	G. W. Van Meter, Architect.
Indiana	Fishers-Switch	July 5	Erecting, etc., 6-room brick school.	W. S. Kaufman, Richmond, Arch.
Kansas	Lawrence	July 5	Erecting an industrial school.	F. P. Smith, Clk. Bd. Educ.
Ohio	Fort Jennings	July 6	Erecting school; also heating, etc.	Morgan & Dillon, Architects.
Georgia	Atlanta	July 6	Erecting fire-station on North Ave.	C. A. Smith, Dwight Bldg., Arch.
Missouri	Kansas City	July 6	Bldg. substructure Westport High School; cost, of building, \$350,000.	C. O. Moackrud, Clk., School Bd.
North Dakota	Galesburg	July 6	Erecting 4-room school building.	

Public Buildings—Continued

New York	New York	July 8, 11 A.M.	Erecting 2 schools, alterations, ventilating, etc., eight others.	C. B. J. Snyder, Supt. Bldgs.
Ohio	Cincinnati	July 8, noon	Erecting high school; cost, \$500,000.	Dr. J. M. Withrow, Chm. Bldg. Com.
Texas	Fort Worth	July 8, 3 P.M.	Extending, remodeling, etc., Federal Bldg.	James Knox Taylor, Wash., D. C.
North Dakota	Madison	July 8	Erecting ladies' dormitory at Normal School.	Secretary Board of Education.
New York	Canton	July 8	Erecting, wiring, plumbing, etc., bldg. for N. Y. S. S. A.	Geo. S. Conkey, Treas. S. Lawr. Univ.
North Dakota	Ashley	July 8	Erecting school, also heating, etc.	Lewis P. Johnson, Clk. Bd. Educ.
Florida	Tallahassee	July 8	Bldg. \$40,000 dormitory Florida Female Col.	N. P. Bryan, Jackson, Chm. Bd. Com.
Massachusetts	Fort Banks	July 8	Repairs and alterations to hospital.	Post Quartermaster
Virginia	Emporia	July 8	Alterations and additions to Co. Court House.	Albert F. Huett, Richmond, Arch.
Indiana	Indianapolis	July 9	Alterations, etc., 2 schools, heating, etc., one.	School Board.
Missouri	Kansas City	July 9	Plumbing the General Hospital.	Root & Senecus, Architects.
Colorado	Colorado Springs	July 9, 3 P.M.	Erecting, wiring, etc., Federal Building.	James Knox Taylor, Wash., D. C.
Tennessee	Knoxville	July 10, 3 P.M.	Extension, etc., Federal Building.	James Knox Taylor, Wash., D. C.
Ohio	Cleveland	July 10	Erecting 7-story high school, 272 x 112 ft. of reinforced concrete; cost, \$600,000.	J. W. Stevens, St. Paul, Minn., Arch.
South Dakota	Pennington	July 12	Furn. and install. heating plant, Co. Court House.	Robt. Rudesill, County Auditor.
Ohio	Sandusky	July 12	Building 8-room addition to school.	Wm. E. Carter, Clk. Bd. Educ.
North Dakota	Bathgate	July 12	Electric wiring, gas piping, plumbing, power house, etc., at new Blind Asylum.	W. J. Burke.
Ohio	Georgetown	July 13	Erecting public hall and office building.	Geo. Hornung, Cincinnati, Con. Engr.
Ohio	Wheelerburg	July 13	Enlarging school, four or eight rooms.	J. B. Fullerton, Clerk Bd. Educ.
Texas	Paris	July 15, noon	Erecting 4-story brick hospital.	Ed. H. McCuiston, Mayor.
Pennsylvania	Wilkes-Barre	July 15, 2 P.M.	Constructing interior work, Co. Court House.	McCormick & French, Architects.
British Columbia	Nelson	July 15	Erecting \$45,000 school.	E. C. Arthur, Sec'y School Bd.
Alabama	Tusculum	July 15	Erecting \$160,000 County jail.	E. J. Ostling, Montgomery, Arch.
California	Banning	July 15	Bldg. one-story, brick, \$15,000 high school.	F. S. Allen, Pasadena, Arch.
Ohio	Cleveland	July 15	Bldg. new \$300,000 technical high school.	Board of Education.
New Jersey	Newark	July 16, 8:30 P.M.	Erecting high school; also heating, etc.	Runyon & Carey, Engineers.
Missouri	St. Joseph	July 17, 3 P.M.	Repairs, etc., to U. S. Post Office.	James Knox Taylor, Wash., D. C.
Indiana	Williamsport	July 18, noon	Reconstructing County Court House.	Robert L. Winks, County Auditor
District of Columbia	Washington	July 18, 2 P.M.	Furn. and installing large metal and plate glass windows for new national museum.	Bernard R. Green, Supt. Con.
Tennessee	Chattanooga	July 18, 3 P.M.	Bldg. extension U. S. Post Office, etc.	James Knox Taylor, Wash., D. C.
Florida	Gainesville	July 19, 3 P.M.	Erecting U. S. Post Office, complete.	James Knox Taylor, Wash., D. C.
Ohio	Athens	July 19	Erecting Infirmary bldg.; also addition to main bldg., etc., Athens State Hospital.	Dr. J. T. Hansen, Sec'y Bd. Trus.
Illinois	Chicago	July 20, 11 A.M.	Cut stone work, Union St. bath house.	John J. Hanberg, Com'r Pub. Wks.
California	Claremont	July 20	Bldg. one-story brick, 90 x 135 ft. \$25,000 school.	F. S. Allen, Pasadena, Arch.
Ohio	Struthers	July 20	Erecting brick and stone, frame and cement block city building.	R. F. Thompson, Youngstown, Arch.
Wyoming	Casper	July 22	Bldg. 2-story brick and stone Court House 66 x 88 ft., inc. electric wiring, heating, etc.	C. A. Randall, Architect.
Illinois	Aurora	July 24, 3 P.M.	Building extension to U. S. Post Office.	James Knox Taylor, Wash., D. C.
North Dakota	Antler	July 24	Bldg. 2-story brick or concrete block school.	B. F. Felton, Clk. School Bd.
Louisiana	New Roads	July 25	Enlarging, etc., Parish jail.	C. J. Hull, Alexandria, Arch.
Massachusetts	Boston	July 27	Rein. concrete floor, Bldg. 107, Navy Yard, \$5,700.	Commanding Officer.
Michigan	Owosso	July 31, 3 P.M.	Constructing U. S. Post Office.	James Knox Taylor, Wash., D. C.
Indiana	Monticello	August 9	Erecting a County Poor Asylum.	County Commissioners.

Bridges

Pennsylvania	Harrisburg	July 5, 2:30 P.M.	Reconstructing Mulberry St. bridge, 2,000 ft. long, 35 ft. rdwy.; 2 walks 5 ft. wide, reinforced concrete; also approaches 39 ft. wide, 554 ft. long, etc.	D. E. Tracy, Sec'y, Bd. Pub. Works
Oregon	Grants Pass	July 5	Building steel bridge; retimbering one.	County Court.
Indiana	Laporte	July 6, 10 A.M.	Constructing two bridges.	Laporte County Commissioners.
Colorado	Denver	July 6, noon	Building steel, steel-wood or reinforced concrete bridge over Rio Grande.	T. W. Jaycox, State Eng'r.
Wisconsin	Lawrence	July 6, noon	Building bridge with 24-foot span.	Geo. P. Hawley, De Pere, Eng'r.
Ohio	Enterprise	July 6, 1 P.M.	Constructing steel superstructure, Falls twp.	County Commissioners, Logan.
Florida	Jacksonville	July 6, 6 P.M.	Bldg. bridge and draw over McGirt's Crk.	J. N. C. Stockton, Pres. Ortega Co.
Minnesota	Crookston	July 8, 10 A.M.	Bldg. 105, 75 and 30 ft. pile bridges; also 36-ft. span, with two 12-ft. approaches.	N. A. Hoffard, County Auditor.
California	Madera	July 8, 10:30 A.M.	Constructing bridge.	W. R. Curtin, Clk., Co. Superv.
New Jersey	Laurel Springs	July 8, 11 A.M.	Erecting bridge over Mills Lake.	J. J. Albertson, Camden Co. Eng'r.
Indiana	Evansville	July 8, 11 A.M.	Bldg. 4 concrete bridges; 2 abutments.	Harry Stinson, County Auditor.
Idaho	Rathdrum	July 8	Erecting bridge over Moore Creek.	Ignatz Weil, Clk., Co. Com'rs.
Ohio	Marion	July 8	Bldg. concrete or masonry substructure; also steel superstructure.	County Commissioners.
New Brunswick	Fredericton	July 8	Constructing two spans each 252-23 ft. long.	C. H. L. Labillois, Com'r Pub. Works
New Mexico	Hagerman	July 8	Erecting metal and concrete bridge, 260 ft. long, 16 ft. roadway over Pecos River.	W. M. Atkinson, Chm. Co. Com'rs
Idaho	Sandpoint	July 8	Erecting bridge over Moore Creek.	Ignatz Weil, Clk., Co. Com'rs.
New Mexico	Roswell	July 8	Erecting metal and conc. bridge, 260 x 16 ft.	W. M. Atkinson, Char. Co. Com'rs.
North Dakota	Fargo	July 9, noon	Erecting three 30-ft., 20, 40, 60, 100, 110 and 120-ft. bridges, various twps.	Arthur C. Lewis, Co. Auditor.
Ohio	Massillon	July 9, noon	Bldg. 123½ ft. bridge, one or two spans, with 30-ft. roadway, two 8-ft. walks.	Frank J. Eppell, Co. Eng'r.
New Jersey	Trenton	July 9	Furn. and bldg. steel-concrete bridge.	M. W. Oberlin, Canton, Co. Aud.
Ohio	Toledo	July 10, noon	Building reinforced conc. arch. bridge, 1,184 ft. long, 70 ft. wide, Cherry St.	Osborn Eng. Co. Cleveland and New York City
Tennessee	Nashville	July 10, noon	Building concrete piers, 2 bridges, 2 rein. concrete viaduct approaches, etc.	Howard M. Jones, Co. Eng.
District of Columbia	Washington	July 11	Reconstructing Pier No. 1, Aqueduct bridge.	Maj. Spencer Cosby, Eng'r Corps.
Ohio	Wapakoneta	July 12, 11 A.M.	Erecting two bridges over Anglaize River.	W. H. Meyer, County Auditor.
Tennessee	Nashville	July 12, noon	Bldg. 2 bridges, 6,000 yds. each, concrete piers, viaduct approaches, etc.	Howard M. Jones, Engineer.
Ohio	Cincinnati	July 12, noon	Erecting 2 culverts and rein. concrete bridge.	Fred Dreihls, County Clerk.
Ohio	Cleveland	July 13, 11 A.M.	Constructing bridge per Report 1579.	A. B. Lea, County Surveyor.
Louisiana	New Orleans	July 15, 1 P.M.	Erecting Bascule or lift bridge.	Charles R. Kennedy, Comptroller
Illinois	Mt. Pulaski	July 15, 1 P.M.	Constructing five steel bridges.	Lake Fork Special Drainage District Commissioners.
Ohio	Jefferson	July 15, 1 P.M.	Building superstructure of steel bridge.	County Commissioners.
Massachusetts	Barnstable	July 15	Bldg. steel bridge on masonry piers, etc.	S. E. Tinkham, Boston, Eng'r.
Nebraska	Beatrice	July 15	Bldg. 30-ft. rein. concrete bridge; also concrete abutment under approach to another.	County Commissioners.
Alberta	Lethbridge	July 15	Bldg. superstructure of bridge.	J. E. Schwitzer, Winnipeg, Eng'r.
Ontario	Toronto	July 16, noon	Supplying and erecting steel ry. bridges and hand-railing, Lansdowne Ave. subway.	C. H. Rust, City Engineer.
Ohio	Sandusky	July 16	Bldg. bridge over Mills Creek, Monroe St.	Chas. Kubach, Co. Auditor.
Nebraska	Fort Snelling	July 19, 11 A.M.	Erecting bridge across Mississippi.	Jas. B. Quinn, Col. Eng'rs. U. S. A.
Ohio	Cincinnati	July 19, noon	Building culvert, removing iron superstructure, etc., Columbia township.	Stanley Struble, Pres. Co. Com'rs.
Porto Rico	San Juan	July 20, 10 A.M.	Plans for 5 steel riveted steel truss highway bridge spans, each 135 ft. 4-in. long between center of pins, 3 bridges.	J. J. Jimenez, Supt. Pub. Works.
Virginia	Culpeper	July 20	Erecting two steel bridges.	W. E. Coons, Clk. Co. Com'rs.

Miscellaneous

New Jersey.....	Paterson.....	July 5, 7:30 P.M.....	Second-size steam fire engine, 1,000 ft. 3-in. 4,000 ft. 2 1/2-in. double jacket fire hose.....	John Stagg, Fire Chief.
Massachusetts.....	Reading.....	July 5.....	Furn. and install. steam engine; also 2 alt. cur. electric generators for city light plant.....	Richard D. Kimball Co. Boston, Eng.
Illinois.....	Lebanon.....	July 8.....	Furnishing engine for electric light plant.....	Owen Ford, St. Louis, Mo., Con. Eng.
Missouri.....	Jackson.....	July 9, 7:30 P.M.....	Complete light and water plant.....	Hiram Phillips, St. Louis, Con. Eng.
New York.....	Brooklyn.....	July 9.....	Disposing of all ashes, str. sweep'gs and rubbish in Boro. for 5 yrs., begin. Oct. 28, 1907	M. Craven, Com'r St. Cleaning.
California.....	St. Helena.....	July 9.....	Sale of franchise for 50 yrs. for transmitting electricity for light and power.....	G. W. Schmidt, Pres. Bd. Trus.
Ohio.....	Arlington.....	July 9.....	Constructing \$8,000 electric light plant.....	Geo. Champe, Toledo, Eng'r.
Montana.....	Deer Lodge.....	July 9.....	Furn. two 115-h. p. boilers for prison.....	Lt. Bd. Prison Com'rs, Butte.
Iowa.....	Des Moines.....	July 10, 11 A.M.....	Imp. channels, 2 rivers; cost, \$275,000.....	W. W. Wise, Chm. Bd. Pub. Wks.
Michigan.....	Crystal Falls.....	July 10, 8 P.M.....	Building addition to city power station.....	Robt. Munns, City Clerk.
California.....	Oakland.....	July 10.....	Sweeping and cleaning by mach., yr. end June 30, 1908, sts. paved with rock or wood blk.	W. B. Fawcett, Sec'y, Bd. Pub. Wks.
Pennsylvania.....	Wilkesburg.....	July 12, 3 P.M.....	Furn. 500 ft. 2 1/2-in. double-jacket, rubber-lined cotton fire hose; also deluge set.....	E. Z. Peffer, Chm. Fire Com.
Ohio.....	Georgetown.....	July 13, noon.....	Boiler, chimney, pole line, arc lamps, switch board, transformers, etc., for light plant now building.....	Geo. Hornung, Cincinnati, Eng'r.
California.....	Ukiah.....	July 13.....	Purchase of franchise of Snow Mountain Water & Power Co., to erect, etc., transmission line in Potter Valley.....	W. V. Kilbourne, Clk. Bd. Trus.
Pennsylvania.....	Bradford.....	July 15.....	Electric lighting, 141 all-night street lights, contract to start June 13, 1908.....	Edward C. Charlton, City Clerk.
New York.....	West Point.....	July 16, noon.....	Steam piping for power house and dis. system	Quartermaster.
Rhode Island.....	Newport.....	July 16.....	Building garbage incinerating plant at Naval Training Station.....	Bureau Supplies & Accounts, Navy Department, Washington, D. C.
Indiana.....	Fort Wayne.....	July 17, 11 A.M.....	Erecting 12-ton garbage crematory.....	Capt. B. B. Hyer, Q. M., U. S. A.
Virginia.....	Fort Myer.....	July 17.....	Erecting 12-ton garbage crematory.....	Capt. B. B. Hyer, Q. M., U. S. A.
New York.....	Durhamville.....	July 18, noon.....	Building arch culvert on aqueduct over Oneida Crk., where Erie Canal crosses.....	F. C. Stevens, Albany, Supt. P. W.
Ohio.....	Cincinnati.....	July 18, 2 P.M.....	Constructing dam of concrete, etc.....	Wm. T. Russell, Col. Engrs., U. S. A.
Michigan.....	Grand Rapids.....	July 18, 8 P.M.....	Bldg. 4,000 cu. yds. concrete, walls, exc. 18,000 cu. yds. rock, 8,000 cu. yds. earth, in connection with flood protection work.....	L. W. Anderson, City Engineer.
Washington.....	Bremerton.....	July 20.....	Furn. two 20-ton 4-motor electric cranes, navy yard, Puget Sound; cost, \$11,000.....	R. C. Hollyday, Chief Bureau Yds. and Docks, Navy Dept., Washington, D. C.
Arkansas.....	Fort Smith.....	July 29, 9 A.M.....	Furn. aerial comb. hook-and-ladder truck.....	D. B. Rowbridge, Chief Fire Dept.
Saskatchewan.....	North Battleford.....	July 31.....	Installing, etc., electric light system, etc.....	Willis Chipman, Toronto, Eng'r.
Pennsylvania.....	Harrisburg.....	August 5, noon.....	Collection and disposal of garbage, etc.; also ashes, etc., for 10 yrs., from Feb. 1, 1908.....	Seymour S. Eberts, Chm. San. Com.
Manitoba.....	Winnipeg.....	September 3, noon.....	Supplying and erecting portions of equipment for hydro-electric works, transmission lines, and receiving transformer station.....	M. Peterson, Sec'y, Bd. Control.
India.....	Calcutta.....	December 31.....	Lighting town by electricity, gas, oil, or other method; now lighted by 9,300 gas lamps of 11,300 24 c.p. and 2,400 c.p. oil lamps.....	Municipal Council.

STREET IMPROVEMENTS

Eaton Rapids, Mich.—The citizens have voted \$15,000 bonds for paving purposes.

Springfield, Mo.—The City Clerk has been directed to advertise for bids for paving certain streets with brick.—J. J. Schneider, President of the Board.

Akron, O.—The ordinance to pave Thorn-ton street has passed the Council.

Cincinnati, O.—Bids will be received, July 18, for the purchase of \$10,000 McMicken avenue paving bonds; interest, 3.65 per cent.—W. C. Culkins, Auditor.

Hamilton, O.—Councilman Welsh states that Council has decided to pave Williams, Wood, and South Fifth streets. Engineer Dillon will prepare plans and estimates at once.

Hamilton, O.—Council has passed an ordinance providing for the paving of one mile of street.

Lorain, O.—The contract for paving Pen-field, Washington, Bank, and Second avenues will be immediately readvertised.

Lorain, O.—Council has passed an ordinance providing for the paving of several streets.

Lorain, O.—The Commissioners have decided to readvertise for bids on the construction of two roads, for which they have already sought to place contracts.

New Bremen, O.—Council will pave First, Washington, Cherry, and Monroe streets, and will construct a sewer in Main street.

Richwood, O.—Surveyor Kennedy of Marysville has estimated the cost of paving Franklin street with vitrified brick and macadam; the improvement will probably be authorized.

Sandusky, O.—Council has definitely decided to pave Monroe street with brick; the improvement will cost about \$14,000.

Toledo, O.—Council has under consideration the issue of bonds for building sidewalks.

Troy, O.—The B. P. S. has awarded the contract for surfacing a number of streets to the Andrews Asphalt Paving, and to the F. W. Kemp for a large amount of asphalt block pavement.

Warren O.—Bids will be received July 13, noon, for \$6,800, 5 per cent. semi-annual East Washington street and \$3,510 East Franklin and North Pine street paving bonds.—William Wallace, President, Sinking Fund Trustees; Chas. B. Selby, Clerk.

Harrisburg, Pa.—Council has passed several paving and sewer ordinances.

Scranton, Pa.—The town will vote soon on the question of a million-dollar bond issue, the proceeds to be applied to the paving of all the principal streets.

Humboldt, Tenn.—The citizens will vote on the question of issuing \$30,000 bonds for street improvements.

Palestine, Tex.—Council has passed an ordinance providing issue of bonds for street improvements.

Bluefield, W. Va.—The town has decided on a bond issue of \$100,000 for street and sewer improvements.

Huntington, W. Va.—The town has decided to expend \$35,000 for street intersections, \$20,000 for an incinerating plant, \$10,000 for sewer purposes, and \$8,000 for improving the fire department.

Racine, Wis.—Bids will be received for paving as follows: Center street, 27,000 square yards of brick and 12,812 lineal feet of concrete curbing; Racine street, 5,400 square yards of brick, 3,224 lineal feet of concrete combination curb and gutter; Freeman Court, 570 square yards of brick, 553 lineal feet of concrete curb and gutter, 2,100 square feet of cement walks, according to plans and specifications.—P. H. McConnolly, Clerk of the Committee.

SEWERAGE

Macon, Ga.—An appropriation of \$5,000 has been made for a sewer system for the Academy of the Blind.

Emmetsburg, Ga.—Bids will be received, August 6, for \$100,500, 5, 5 1/2 or 6 per cent. Palo Alto County Drainage bonds.—Sim R. Steadman, County Auditor.

Iron River, Mich.—Ordinance has been passed for the construction of a sewer system in certain districts.—Chas. A. Otto, Village Clerk.

Joplin, Mo.—Plans and specifications for a separate system of drainage and sewers are being made.—Burns and McDonnell, Kansas City, Mo., Engineers.

Beatrice, Neb.—An ordinance has been passed authorizing the construction of a sewer system in certain streets.—S. H. Evey, City Clerk.

Rockingham, N. C.—Bids will be received, July 17, for the purchase of \$30,000 sewer and water bonds.—W. L. Scales, Treasurer.

Defiance, O.—A large sewer will be built on Wabash avenue and Pearl street; it will be of 24-inch tile; plans will be immediately prepared.

Elmwood, O.—Councilman Ryan states that there will be a bond issue this fall for the construction of sewers.

Oxford, O.—The question of building sewers is again being agitated; the proposition to issue \$50,000 bonds for that purpose was defeated, but it is believed that it will be carried at the next election.

Youngstown, O.—The B. P. S. is about to advertise for bids for constructing the large

sewer in Falls avenue; Anthony O'Horo received this contract a year ago, but is unable to carry it out.

Ballinger, Tex.—Plans are being prepared for constructing sewers to be installed by the Odorless Sewerage Co., at an estimated cost of \$15,000.—J. R. Potts, Fort Worth, Tex., Engineer.

Richmond, Va.—Ordinances will soon be passed appropriating \$16,900 for the construction of 15-inch sewers in three streets, 20x30-inch sewers in Taylor street, and for other sewer improvements in the "Annexed Territory."—W. E. Cutshaw, City Engineer.

Centralia, Wash.—The matter of issuing bonds for the construction of a sewer system is under consideration; plans and estimates have been ordered.

Neenah, Wis.—The Board of Public Works has ordered the City Clerk to advertise for sewer pipe to be used this summer.

WATER SUPPLY

Brunbige, Ala.—Council is negotiating plans for the construction of proposed light and water plant; estimated cost, \$17,000.

Florale, Ala.—The City Clerk has been authorized to issue \$30,000 water works and school bonds.—J. F. Gilmes, City Clerk.

Denver, Col.—The Denver Union Water Company will expend \$700,000 in improving water plant during the present year.—David H. Moffat, President.

Waycross, Ga.—Council has granted a franchise to Geo. W. Been and others for the purpose of establishing an electric light plant.

Sherrard, Ill.—The village desires bids on material for a water works system; for plans and specifications write to C. E. Peterson, Village Clerk.

Richmond, Ind.—This city will expend about \$60,000 for the repair and betterment of the water works plant.

Durand, I. T.—The citizens have voted \$35,000 bonds for water supply.

Louisville, Ky.—Chief Engineer Chas. Hermann of the Louisville Water Company is preparing specifications for establishing an engine at the pumping station of the river; estimated cost, \$300,000.

Evart, Mich.—The Legislature has authorized the village to issue bonds amounting to \$40,000 for a water works system.

Milan, Mich.—Plans have been prepared for water works.—Riggs & Sherman, Toledo, O., Engineers.

Comfrey, Minn.—Bids will be received, July 8, for the purchase of \$4,000 6 per cent. water works bonds.—W. B. Brooks, Village Recorder.

Meridian, Miss.—The Meridian Light and Railway Company proposes to extend its line

three miles to Popular Springs; the company will expend \$200,000 for improvements and extensions.—A. B. Paterson, General Manager.

Rockingham, N. C.—Plans for water works and sewerage system are being made.—G. C. White, Durham, N. C., Engineer.

Shelby, N. C.—Harry A. Knox is preparing specifications to a water system; estimated cost, \$30,000.

Wilson, N. C.—The city is preparing to install a water system.—T. J. Grantham, City Engineer.

Buffalo, N. Y.—A half-million gallon steel tank with steel frame and inch shell will be built at Kuayhn and Colfax avenues.—F. G. Ward, Commissioner of Public Works.

Akron, O.—An ordinance has been passed providing for constructing many sewers and filter beds.

Ashland, O.—Engineer Niederheiser is preparing plans and specifications for the proposed improvement and extension of the water works system; Council decided not to employ an expert engineer to assist the Village Engineer in this work.

Barberton, O.—The Alladin Rubber Company has petitioned for an extension of water mains of the plant.

Canal Dover, O.—The B. P. S. is planning on laying about 3,000 feet of water pipe at once.

Massillon, O.—Engineers Riggs and Sherman have been selected by Council at a cost of \$500 for the work of Consulting Engineers in connection with the construction of the water works plant.

Norwood, O.—An ordinance has been passed authorizing an issue of \$43,000 bonds for the purchase of land for a water works plant.

Oberlin, O.—Engineer Gerrish has drawn up plans for new filter beds at an estimated cost of \$10,000.

Johnson City, Tenn.—The City Water Company has been incorporated with a capital stock of \$60,000, by J. W. Cox, Isaac Foreland, and a number of others.

Richmond, Va.—An ordinance will soon be passed appropriating \$14,763.34 for construction of 12-inch water mains in three streets; 8-inch mains in eight streets, and 6-inch mains in three streets in the "Annexed Territory." Also setting apart \$5,939.10 for construction of 6-inch mains in two streets and 8 and 12-inch mains in two other streets.—W. C. Cutshaw, City Engineer.

Fond-du-Lac, Wis.—Council has voted to build a pipe line to bring the water supply from the lake by gravity pressure for additional fire protection and manufacturing purposes; probable cost, \$50,000.

LIGHTING AND ELECTRICITY

Stephen, Ark.—The Stephen Light and Power Company proposes to purchase additional electric machinery.—M. L. Milner, General Manager.

Nafee, Cal.—A franchise for electric lighting has been granted to W. J. Liddon.

Pensacola, Fla.—The Pensacola Electric Company is preparing to make extensive improvements.

Augusta, Ga.—The five-year Augusta lighting contract with the Augusta Railway & Electric Company will expire Aug. 2; Council will take up the matter at the July meeting of the Board.

Columbus, Ga.—The City Council has passed an ordinance authorizing a bond issue of \$100,000 for a municipal electric light plant.

Plymouth, Ind.—The Plymouth Lighting Company will build and equip a lighting plant in this city.

Brookville, Ind.—The Brookville Electric and Ice Company, recently incorporated with a capital stock of \$75,000, will ask for bids soon for construction and equipment of an electric light and artificial ice plant.—Charles Andrews, President.

Shreveport, La.—Adkins Bros. have been granted a franchise to furnish natural gas at a rate not exceeding 25 cts. per 1,000 cu. ft.

Richmond, Me.—The Richmond Light Company, organized for the purpose of manufacturing and generating gas and electricity and disposing of the same for light, heat and power, with \$10,000 capital stock, of which \$3,000 is paid in.—Benjamin F. Curtis, President; A. E. Small, Treasurer.

Houghton, Mich.—Plans for a municipal lighting plant are being made.—E. T. Sykes, Minneapolis.

Negaunee, Mich.—It is proposed to increase the capacity of the municipal electric light plant by installing a 500-K.W. generator.

Brookfield, Mo.—The city electric light plant has been damaged by fire.

Morristown, N. J.—The Morris and Somerset Electric Company has been incorporated with a capital stock of \$500,000, to manufacture and generate electric current for light, heat and power.—Francis Landon Humphreys, John M. Forbes, and others, Incorporators.

Canandaigua, N. Y.—The Ontario Light and Traction Company is preparing to build

a new plant; a concrete structure will be built and new machinery installed; the old style arc lamps now in use will be abolished and new arc lamps installed.

Phelps, N. Y.—The Niagara Falls, Lockport & Ontario Power Company, it is reported, will petition the Village Trustees for a franchise.

Raleigh, N. C.—The Raleigh Electric Company has been granted a franchise to extend its line $3\frac{1}{2}$ miles; estimated cost of improvements, \$125,000.

Arlington, O.—Council has accepted plans for construction of a municipal electric lighting plant. George Chample, Toledo, will supervise the construction.

Ashtabula, O.—The B. P. S. estimates the cost to repair the lighting plant at \$88,000; the cost of a 750-k.w. generator with engine direct connected will be \$41,000; no definite plan of procedure has been adopted.

Cleveland, O.—The Gainer Electric Company has been incorporated with a capital stock of \$25,000, by B. J. Sawyer, William Griffith, Peter A. Ruff, and others.

Elyria, O.—Elyria will vote on the proposition to establish a municipal lighting plant at a cost of \$75,000; Council decided to submit the proposition to the people, August 19.

Lima, O.—Engineers are making preliminary plans for the construction of the municipal lighting plant; an appropriation of \$500 will be made for securing plans for a suitable system for this town.

Hazleton, Pa.—Plans and specifications for the building of a sub-station for the Consumer's Electric Light and Power Company are now on file and contractors wishing to bid on the building can see them on application.—Consumers' Electric Light and Power Company, 16 North Wyoming street.

Pittsburg, Pa.—An ordinance is pending in Council, granting a franchise to the Diamond Light and Power Company to erect poles and string wires for the transmission of electric current for heat, light and power purposes.

York, Pa.—Steps are being taken to increase the capital stock of the York Gas Company by \$400,000 and improvements made for the company to greatly increase its facilities for handling an enlarged output; at present an additional large gas boiler is being erected for the company at its plant near Hanover railway bridge.

Seneca, S. C.—Bids will be received, July 6, for the purchase of \$15,000 5 per cent. 40-year electric light bonds.—W. F. Austin, Chairman, Board of Public Improvements.

Armour, S. D.—Arrangements have been made for a new electric lighting plant; the building will be of cement blocks.

Richmond, Va.—An ordinance will be passed appropriating \$22,265 for extension of gas pipes and mains in the Reserved Territory, including 3, 4 and 6-inch pipe in eleven streets.—W. P. Knowlton, Superintendent of Lighting.

FIRE EQUIPMENT

Bogalusa, La.—A fire department is being organized.

Canilla, Ga.—The city has voted to issue \$4,000 in bonds for building engine house.

Bloomington, Ill.—The Chicago & Alton Railway Company proposes to establish a fire station at the inside shop yards; there will be a number of hand extinguishers, chemical wagon, hose wagons, etc., together with 150 feet of hose.

Ligonier, Ind.—A fire alarm system will be installed.

Wellington, Kan.—The citizens have voted \$25,000 bonds for the erection of Fire Department Headquarters.

Ballard, Ky.—The Chief of the Fire Department has petitioned for additional equipment for the Fire Department.

Bordentown, N. J.—Chief Chas. E. Burr has asked for more hose and a new truck.

Portsmouth, N. H.—A combination hose wagon will be bought.—Chief Charles E. Murden.

Elizabeth, N. J.—A new truck, more boxes, a new house and new hose are wanted.—August Gerstung, Chief.

Canton, O.—The Board of Public Safety has petitioned Council for \$60,000 bonds for the erection of engine house.

Westbrook, Me.—The sum of \$300 has been voted for new hose.

Cincinnati, O.—Bids will be received, July 18, for the purchase of \$23,000 4 per cent. Fire Department bonds.—W. C. Culkins, City Auditor.

Glenside, Pa.—A new fire house will be built for the Glenside Fire Company.

Harrisburg, Pa.—A committee of citizens of the East End have petitioned for fire fighting apparatus and a house to keep it in.

Pittsburg, Pa.—Under several ordinances presented in Common Council and referred to committees, contracts for the erection of fire engine houses and police stations in several Wards of the city can be awarded almost at once, and the construction work involving \$160,000 started. These ordinances were: Engine house and police station, Thir-

ty-second Ward, to take place of old buildings utilized now, \$40,000; police station, Twenty-third Ward, to take place of present No. 10 station, \$20,000; engine house, Twenty-first Ward, new, \$30,000; hose house and site, Thirty-ninth Ward, new, \$15,000; engine house, Nineteenth Ward, new, \$25,000; engine house, Eighteenth Ward, new, \$30,000; the money to erect these buildings was provided by bonds recently sold.—George W. Guthrie, Mayor.

Palestine, Tex.—A fire station will be built.

Richmond, Va.—An ordinance will be passed appropriating \$22,520 for the purchase of a site and the construction of engine houses in the northeastern and northwestern sections of the newly assessed territory.—George C. Shaw, Fire Chief.

PUBLIC BUILDINGS

San Diego, Cal.—The citizens have voted \$150,000 bonds for school purposes. Address Clerk of the Board.

Galesburg, Ill.—The citizens have voted \$10,000 bonds for improving school.

Goshen, Ind.—Bids will be received, August 5, for the purchase of \$50,000 Court House bonds, interest 4 per cent.

Vincennes, Ind.—Charles C. Wedding & Co. of Indianapolis purchased \$35,000 school bonds at a premium of \$1,150.

Wellington, Kan.—Bonds have been voted for the erection of a City Hall and Fire Department Headquarters.

Wichita, Kan.—A special election will be held to decide the question of issuing \$15,000 school bonds.

New Bedford, Mass.—Council has authorized the issue of \$150,000 for reconstructing its present City Hall into a library building.

Biloxi, Miss.—An ordinance has been passed authorizing an issue of \$50,000 5 per cent. school bonds.

Cincinnati, O.—Bids will be received, July 2, for the purchase of \$250,000 school bonds. Interest 3.65 per cent., payable in 40 years after date. A certified check required with each bid.—Wm. Grautman, Clerk.

Pataskala, O.—Bids will be received, July 6, for the purchase of \$6,000 1-30-years 4½ per cent. school bonds.—Seymour Smith, Clerk of the Board.

Pleasant Ridge, O.—The question of issuing \$75,000 bonds for the erection of a school house will be submitted to a vote of the people.

Blum, Tex.—The Attorney-General has approved an issue of \$10,000 school bonds.

Childress, Tex.—The Attorney General has approved an issue of \$8,000 5 per cent. school bonds.

Chillicothe, Tex.—Bonds, \$15,000, have been voted for erecting school house.

Gatesville, Tex.—The Attorney General has approved an issue of \$10,000 4½ per cent. school bonds.

Richmond, Va.—Council will appropriate \$31,000 for the purchase of a site and the construction of a school house in Fairmount; also an additional appropriation of \$17,082.50 for the purchase of school site in the Annexed Territory, \$10,082.50 for white schools there, and \$6,000 for the purchasing of a lot for white Oakwood school.—Carlton McCarthy, Mayor.

STREET RAILWAYS

Bisbee, Ariz.—Council has granted to the Warren Company a franchise to operate an electric railway through certain streets of the city.

Los Angeles, Cal.—The Port Orange & Santa Ana Railway Company has been incorporated with a capital stock of \$500,000, by Frank F. Johnson, Walter G. Hopkins, A. F. Lijehl and others; the company will build standard-gauge electric railway.

Greeley, Col.—The Greeley Electric Company has been incorporated for the purpose of building an electric line from Greeley to Denver.—John M. P. Petrikin, First National Bank; E. J. Decler, of the Union National Bank, Incorporators.

Augusta, Ga.—The Augusta & Columbia Railway Company, recently chartered, has completed survey for the proposed extension of the Augusta & Aiken Railway to Columbia; the North Augusta Electric & Improvement Company will be absorbed by the new corporation.—E. P. Wetmore, General Manager.

Bloomington, Ill.—The Corn Belt Traction Company, which is planning to build an interurban line from Champaign to this city, is actively engaged in securing franchises in all towns through which the line will pass.

Chicago, Ill.—The Chicago & Wisconsin Traction Company has been incorporated, with a capital stock of \$10,000, for constructing a line from Chicago in a northerly and northwesterly direction to the State line between Illinois and Wisconsin.—H. H. Yarnvan, Lewis E. Starr and others, Incorporators.

Frontenac, Kan.—The Girard Coal Belt Electric Railway & Light Company has been

granted franchise by the City Council to build and operate an electric railway within the city limits.

Ithaca, N. Y.—The Ithaca-Owego Traction Company has incorporated, with a capital of \$200,000, to build an electric railway 50 miles long from Ithaca to Owego.—J. F. Delaney, C. W. Munson, of Chicago, and others.

Waterloo, N. Y.—The Auburn & Northern Electric Railroad has filed certificates of extension of their line, a distance of approximately nine miles; the road is then to cross the Cayuga and Seneca canal and Cayuga lake, and go westerly to the village of Seneca Falls, a distance of 2.44 miles.

Raleigh, N. C.—The Board of Aldermen has finally agreed to the proposition of the Raleigh Electric Company, whereby the city will grade and put in order certain streets for the extension of the street car system, the extension to be about three and a half miles, extending into the eastern, northeastern, southwestern and southeastern sections of the city.

Johnstown, Pa.—Council will pass ordinance granting the Johnstown Passenger Railway Company the right to double-track its line on Bedford street to Horner street.

Lewistown, Pa.—The Juniata Valley Electric Company of Lewistown, has been incorporated, with a capital stock of \$5,000.

Wheeling, W. Va.—The City & Elm Grove Railroad Company has applied for a franchise in Elm Grove, W. Va.—Charles Maden, Secretary.

Fort Francis, Ont., Can.—Proposals have been made by local capitalists to build an electric railway from here to Duluth; power will be available upon the completion of the power dam at International Falls, on Rainy River.—W. H. Elliott is interested.

St. Catharines, Ont., Can.—The Sunnville, Wellandport & Beamsville Electric Company has been incorporated to build a road 40 miles in length.—J. A. Ross, local representative.

BRIDGES

San Diego, Cal.—The Street Commissioners are preparing to construct five reinforced-concrete bridges at C, D, F, G, and I streets; estimated cost, \$50,000.

Clinton, Ill.—The Highway Commissioners have decided to build a 75-foot steel bridge over the Ten-mile creek, west of Clinton.

Portland, Ind.—The Jay County Commissioners have adjourned their June session, after adopting and placing on file the plans and specifications for seven new bridges and one levee.

Hagerstown, Md.—The Board of County Commissioners has formally passed an order permitting the Washington and Berkeley Bridge Company to erect a bridge across the Potomac river at Williamsport for general traffic purposes and the use of a steam railroad or trolley line.

Norfield, Miss.—The Board of Supervisors has adopted plans for the construction of a steel bridge across Bogue Chitto river at Norfield; bids are asked until the July meeting.—E. P. Alsbury & Son, Architects.

Trenton, N. J.—After inspecting the bridge over Hannah Moore's creek on the road leading from Pennington to Princeton, the Bridge Committee of the Board of Freeholders has decided to recommend to the Board that a new one be built.

Bethlehem, Pa.—The borough officials propose to build two bridges, one across the Lehigh river and one across the McCavoy creek.

Bethlehem, Pa.—The Commissioners of Northampton and Lehigh counties have decided to replace the condemned Broad street bridge with a new 60-foot structure, and with 40-foot driveway, to be built of reinforced concrete, at a cost not exceeding \$100,000.

York, Pa.—Efforts are being made to have a new bridge erected at the old Furnace bridge, where Penn. Manheim, Heidelberg and West Manheim townships meet, on the Hanover and Jefferson roads.

Toledo, O.—Bids will be received, July 3, for the purchase of \$525,000 4 per cent. Cherry street bridge bonds.—R. G. Bacon, City Auditor.

Houston, Tex.—The County Auditor has been directed to advertise for bids for the purchase of \$500,000 4 per cent. 40-year bridge bonds.

Tacoma, Wash.—Council has granted the petition of the Oregon & Washington to vacate certain streets on condition that the road build two viaducts.

Menominee, Wis.—The city must build a bridge across Cedar creek before November 15, at which time the contract between the city and the Wisconsin Power Company expires; estimated cost, \$4,000.

Lethbridge, Alberta, Can.—The Canadian Pacific Railroad is preparing to call for tenders for a steel bridge to be built across the Kipp river, near Lethbridge, Alberta, which will be the longest in the world, being slightly over one mile from end to end, and in the center 320 feet above the water level;

the total cost of the structure will be about \$1,000,000, and it will be completed in one year.

MISCELLANEOUS

Washington, D. C.—In reference to Foreign Trade Opportunity No. 1112, which called attention to a cablegram from Minister Gummeré, at Tangier, that the Government of Morocco is in the market for equipments for 2,500 police, another telegraphic message has been received from him conveying the following information: Specifications of the police equipments were forwarded by post to Washington on June 17. The date of publication of the time bids are to be made will not be settled until the Sultan's approval has been received. Another telegram will be forwarded immediately when this date is decided upon. These specifications do not include armament, which will be considered later.—Address Bureau of Manufactures No. 1132.

Camilla, Ga.—The city has voted \$8,000 bonds for the construction of ice plant.

Macon, Ga.—The Massee-Penton Lumber Company is making extensive improvements; the plant will be well protected from fire; a steel tower and tank constructed and installed, hose purchased, and factory equipped with automatic fire sprinklers; \$5,000 will also be spent in sewer system in connection with the plant.—Chas. H. Fuller, of Montpelier, Vt., President.

Chicago, Ill.—The South Park Board has decided to issue \$1,000,000 in bonds for extending the park system on the South Side.

New Orleans, La.—The New Orleans Levee Board proposes to let contracts before August 1, for \$3,000,000 worth of levee work.

Elizabeth, N. J.—Council has decided to purchase for \$53,000 a site for a new park, which is to be bounded by Meadow street, Mary street and Adams avenue, from the Gabler estate; the site has a frontage of 253 feet on Meadow street, 115 feet on Mary street and 242 feet on Adams avenue; the Parks and Shade Trees Committee recommended its purchase.

Long Branch, N. J.—Bonds, \$100,000, have been voted to complete the ocean front improvements, which will cost about half a million dollars.

Lorain, O.—A bond issue of \$50,000 for improving the Black river by the construction of a protecting wall will be authorized by Council.

Sandusky, O.—Bids will be received, July 12, for the purchase of \$19,000 4 per cent. Fire Department and sewer bonds.—Alex. M. Wagner, City Clerk.

Harrisburg, Pa.—Bids will be received until August 5, noon, for the collection and sanitary disposal of the garbage and dead animals and the removal of ashes and miscellaneous refuse for period of ten years, from February 1, 1908.—Seymour S. Eberts, Chairman, Sanitary Committee.

Seattle, Wash.—Bids will be received at the Engineer Department of the Pacific Coast for dredging Gray's harbor and Willapa harbor; about \$200,000 will be expended.

BIDS RECEIVED

Montgomery, Ala.—The Memphis Asphalt & Paving Company submitted a proposal to lay asphalt on Wilson and Caroline streets, at \$2.23 per square yard, and granite headers at 42 cents per lineal foot.

Byron Sanders Company was low bidder for laying sidewalks on Perry street, from Julia to Felder, as follows: Curb, 5-inch granite, per lineal foot, 44 cents; storm water sewers, 18-inch terra-cotta pipe, per lineal foot, 95 cents; storm water sewers, 15-inch terra-cotta pipe, per lineal foot, 75 cents; catchbasins, of brick, \$28.50; inlets of brick, etc., \$16.25; excavation, 15 cents; embankment, 45 cents; storm water connections, 8-inch, etc., 35 cents; storm water sewers, connections, 6-inch, per lineal foot, 28 cents; brick surface gutters, per lineal foot, 30 cents; brick laid in retaining walls, and gutters back of walls, \$17; brick driveways, per square yard, \$2.25; brick steps with side walls, each \$2.75; Schillinger pavement, per square foot, 13½ cents; Hexagon blocks, 14½ cents.

J. S. Couniff & Co. were low on laying sidewalks on Fielder street, from Court to Norman Bridge road, as follows: Curb, 5-inch granite, per lineal foot, 46 cents; storm water sewer, 30-inch, \$3.95; storm water sewers, 18-inch, 97½ cents; storm water sewers, 15-inch, 77½ cents; catchbasins of brick, etc., \$28.50; inlets, of brick, etc., \$17.50; excavation, 21 cents; embankment, 49 cents; storm sewer connections, 6-inch, 30 cents; brick surface gutters, per lineal foot, 31½ cents; brick laid in retaining walls, and gutters back of walls, \$17.50; brick driveways, per square yard, \$2.35; brick steps, with side walls, each, \$2.80; Schillinger pavement, 14 cents; Hexagon blocks, per square foot, 15½ cents.

Waterbury, Conn.—Contaldi & D'Aurlo have been awarded contract to construct

sewers in Robbins and West Main streets, at \$1,998; also for constructing storm water drain in Benedict street.

Washington, D. C.—The District Commissioners have awarded to the Hersey Manufacturing Company, East Boston, Mass., and the Neptune Meter Company, New York, contract for 2,500 meters at \$9 each; the Lynchburg Foundry Company, Lynchburg, Va., got the contract for meter box covers at \$1.14 each.

Newcastle, Ind.—Martin Brothers, of Hamilton, O., have been awarded contract to erect the big power house for the Light, Heat and Power Company; the boilers will have a capacity of nearly 1,000-h.p., and the equipment will carry 20,000 lights.

South Bend, Ind.—The Union Asphalt and Construction Company have been awarded the contract for paving Jefferson and Main streets with asphalt, for \$16,000.—Alonzo J. Hammond, City Engineer.

West Branch, Iowa.—Turner & Rowland, of Des Moines, Ia., have received contract for building water works plant, for \$15,000.

Medford, Mass.—The Metropolitan Park Commission has awarded contract for building additional span and boat lock at Main street, Mystic river, to the Austin Engineering and Construction Company, at \$39,015, as follows: 7,700 yards earth excavation, at \$1; 560 lineal feet cofferdam, at \$8.50; 2,000 feet spruce piles, at 23 cents; 300 feet concrete piles, at 45 cents; 1,680 cubic yards concrete masonry 1:3:6, 1,150 cubic yards cement masonry 1:2½:5, at \$10; 1 to 20-foot concrete and steel bridge span, \$2,700; Jones & Meehan, of Boston, bid \$4,000 for the bridge span and \$52,750 for the entire work.—John R. Roblin, Engineer.

Cedar Falls, Ia.—W. A. Bryant & Sons Company have secured the contract for street paving during the present season for \$26,759.

Albert Sea, Minn.—The following bids were received for the construction of 2,786 feet 6-inch water main extension: Aug. Geisler, Albert Sea, \$3,518 (contract awarded); W. C. Frazer, Rochester, Minn., \$3,897; W. D. Lovell, Minneapolis, Minn., \$3,800; J. W. Turner Improvement Company, Des Moines, Ia., \$4,067; E. W. Knatoald and W. E. Bickford, Albert Sea, Minn., \$5,565.

Grand Forks, N. D.—The Kettle River Quarries Company, Minneapolis, Minn., has been awarded contract for repairing the business section with creosoted block, the final vote of Council being eight for this material and six of Council against. Mayor George E. Dins being in favor of blown granitoid; twenty-five blocks are to be paved at an expense of nearly \$250,000, but not more than fifteen will be repaved this season.

Paterson, N. J.—The Board of Works has awarded the contract for the repair of the asphalt on Main and Market streets to John R. Lee at \$3.50 per square yard.

Trenton, N. J.—The Board of Water Commissioners have let a contract to William R. Throop at \$12,222 to construct a stand-pipe 20 feet in diameter and 80 feet high. The Plate Iron Works, Dayton, O., have been awarded the contract for installing two pumps of 1,000,000 gallons daily capacity for \$12,500; the contract for constructing pump house has been let to S. W. Mather & Sons, of Trenton, for \$5,386.

Hoosick Falls, N. Y.—The Village Board of Trustees has awarded contract to the Ludlow Valve Manufacturing Company, of Troy, to furnish for \$1,200 10 hydrants, 7 5-inch valves, 10 6-inch valves, 13 8-inch valves, 11 10-inch valves, 4 12-inch valves, 45 valve boxes; to the Goulds Manufacturing Company, of Seneca Falls, contract to furnish for \$2,153 a 10-inch by 12-inch double acting triplex power piston pump and extras according to specifications; to the Pope Metals Company, New York City, contract to furnish for \$6.35 per one hundred pounds, with 8 tons St. Joe brand prime pig lead, delivered in Hoosick Falls, according to quotations made; to the H. Mueller Manufacturing Company, New York City, contract to furnish 200 ¾-inch corporation cocks fitted with lead pipe goose neck connections, and M. & H. brass union, at \$1.88 each; 50 ¾-inch curb cocks at \$14 per dozen; 1 Columbia tapping machine at \$62.60; to the Capital Construction Company, Sandy Hill, contract for laying pipe, etc., according to the plans and specifications bid upon, and subject to be executed by the Capital Construction Company and the President and Clerk for the Village.

Schenectady, N. Y.—The contract for the beautifying of Crescent Park has been awarded to George W. Van Vranken for \$3,140; the Charlton Nursery Company submitted a bid of \$3,558.50.

Solvay, N. Y.—The taxpayers have voted to make a contract with the Onondaga County Suburban Water Company to supply water to the village for a period of fifteen years.—James F. Mathews, Trustee.

South Milwaukee, Wis.—The contract for laying 900 feet of intake pipe has been let to M. O. Cluchey, of Ludington, Mich., for \$3,600.

Proposals

INTERIOR WORK—COURT HOUSE

Luzerne County Court House. Sealed proposals will be received by the County Controller of Luzerne County, until 2 o'clock p. m., Monday, July 15, 1907, for the construction of the interior work of the Court House building of the County of Luzerne, now being erected on river common, at the corner of North River and North streets, in the City of Wilkes-Barre, Pa. Plans and specifications prepared by McCormick & French, Architects, and blank forms of contract to be entered into can be seen at the Commissioners' office, in the Court house on Public Square, Wilkes-Barre, Pa.

Every bidder must sign the form of contract on file in the Commissioners' office of Luzerne County, and file a bond with and as a part of the bid. The bond shall be in the amount of the bid, and shall be executed by a surety company or by sureties satisfactory to and approved by the Commissioners of Luzerne County.

A certified check or a bond for 5 per cent. of the amount of the bid must be enclosed in an envelope containing the proposal, as a guarantee that the bidder will enter into the contract, if his bid is accepted by the County Commissioners.

Every bidder must set forth in his proposal the number of days in which he will complete the contract from the time of the execution and delivery of the contract.

All bids to be filled out on blanks which can be had at the County Commissioners' office of Luzerne County.

All certified checks and bonds deposited by bidders whose proposals shall not be accepted by the County of Luzerne will be returned to the person or persons making the same as soon as the successful bidder has been selected.

Bidders must set forth in their proposals their names and places of business and the delivery of a notice to such place of business shall be deemed to be a sufficient delivery and notice to such bidder.

The contract will be let to the lowest and best bidder and if the bidder shall fail to commence work under the contract as required, the amount of the certified check or guarantee bond for 5 per cent. of the contract price shall be forfeited to the County of Luzerne without diminishing or impairing its just right to damages.

The County of Luzerne reserves the right to reject any and all proposals and shall not incur any liability hereunder unless contract be executed by the county commissioners.

Bids to be indorsed, "Proposals for construction of the interior work of the new court house, Wilkes-Barre, Luzerne County, Pa." with the name of the person or persons or corporations making the same.

JAMES M. NORRIS,
Controller.

Attest:
JAMES A. DEWEY,
Deputy Controller.

ELECTRIC LIGHTING

Bradford, Pa.

Address E. C. Charlton, City Clerk, Bradford, Pa.; bond of \$1,000; bids close July 15; contract to start June 13, 1908; minimum 141 all-night street lights.

EDWARD C. CHARLTON,
City Clerk.

IMPROVING RIVERS

Improving the Channels of the Raccoon River and Des Moines River at Des Moines, Iowa

Sealed proposals will be received by the Board of Public Works of the city of Des Moines, at its office in the City Hall, until 11 o'clock, a. m., on the 10th day of July, 1907, for the following described improvements, as per plans and specifications now on file in the office of the Board of Public Works.

For the improvement of the channels of the Raccoon river and the Des Moines river within the corporate limits of the city of Des Moines. Work to begin on or before the 10th day of August, 1907, and to be completed on or before the 1st day of April, 1910.

Cost of said work to be paid from a special fund to be created by the issuance of bonds in accordance with provisions of Section 8, Chapter 33, of the laws of the Thirtieth general assembly of Iowa, and such bonds to be payable out of the proceeds of a tax to be levied under the provisions of said Chapter 33 of the laws of the Thirtieth general assembly of Iowa. Payment will be made in accordance with the provisions of the specifications above referred to.

Each bid must be accompanied with a certified check enclosed in a separate envelope, said check to be drawn on some known responsible bank and made payable to the order of the City Treasurer of the city of Des Moines, in the sum of Thirty-five thousand (\$35,000) dollars. All envelopes must be addressed to the Board of Public Works, and endorsed with the name of the bidder and the improvement said check and proposal are for. Proposal blanks will be furnished at this office to be used in the making of all bids. Certified checks accompanying proposals will be returned to the unsuccessful bidders and also to the bidder to whom the contract is awarded when he shall have entered into contract, in the form prescribed by the Board of Public Works, and given bond in the sum required, which shall not be less than Seventy-five thousand (\$75,000) dollars with a corporate surety to execute said work. In case the successful bidder shall fail to enter into contract, or furnish bond as required by law, said check shall be forfeited to the city of Des Moines as agreed and liquidated damages. The right is reserved to reject any and all bids. Proposals received will be acted upon by the Board of Public Works on the 12th day of July, 1907.

For further information, plans and specifications address Geo. D. Dobson, City Engineer, Des Moines, Iowa.

W. W. WISE,
W. F. HARSH,
Board of Public Works.

Des Moines, Iowa.

WATER AND LIGHT PLANT

Jackson, Mo.

Sealed bids will be received by the City of Jackson, Mo., until 7:30 p. m., Tuesday, July 9, 1907, for furnishing all materials, tools, and labor necessary to install a complete water and light plant. Deposit required, five (5) per cent. of bid.

Plans and specifications are on file with City Clerk of Jackson, Mo., and Hiram Phillips, Consulting Engineer, 615 Frisco Building, St. Louis, Mo., from whom contractors can obtain instruction to bidders and forms of proposals.

WILLIAM PAAR,
City Clerk.

BRIDGE

New Orleans, La., May 31, 1907.

Pursuant to ordinance No. 4551, N.C.S., sealed proposals will be received at the office of the Comptroller in the City of New Orleans until the hour of 1 p. m., Monday, July 15, 1907, for the erection of a new bridge of the Bascule, or lift type, to span Bayou St. John, on the prolongation of the axis of Esplanade avenue, in accordance with plans and specifications on file in the office of the City Engineer.

Deposit \$1,500 with the City Treasurer, and his receipt enclosed with bid. Bond in an amount equal to the contract price.

The City Engineer will furnish bidders with a blank form of proposal; no proposal will be considered unless submitted on such form. Bidders must have paid their city license in order that their bids may be accepted.

Terms of payment, cash.

The city reserves the right to reject any and all bids.

CHAS. R. KENNEDY,
Comptroller.

Civil Service Examinations

MUNICIPAL CIVIL SERVICE COMMISSION

299 Broadway.

New York, June 11, 1907.

Public Notice is Hereby Given that applications will be received from Tuesday, June 11, until 4 P.M. Thursday, July 11, 1907, for the position of

ASSISTANT ENGINEER, BOARD OF WATER SUPPLY.

The examination will be held on Wednesday, July 31, 1907, at 10 A.M. Candidates should not apply for this position unless they are ready to accept employment in any part of the State where their services may be needed.

The requirement of residence in the State of New York has been waived so far as it applies to this examination.

That section of Rule VIII, requiring that applications from non-residents of the City should bear the certificates of at least two reputable citizens of the City of New York has been waived for this examination subject to the approval of the Mayor and the State Civil Service Commission.

Applications must be made on forms supplied by the Commission.

The salary is \$1,350 per annum and upwards. For further information as to compensation and qualification for the position, address the Board of Water Supply, 299 Broadway, New York City.

FRANK A. SPENCER, Secretary.

PHYSICIAN—With three years' experience in bacteriological and sanitary chemical work, would like to associate himself with a firm of sanitary engineers.—Address W. G. E., Municipal Journal and Engineer.

INSTRUCTORS — Mathematics, \$1,000; Physics, \$780; Pharmacology, \$1,500; Mining Engineering, \$1,800; Science, \$900; Forestry, \$900; Military Science, \$1,000; Civil Engineering, \$1,200; Metallurgy, \$1,200. Hapgoods, 305 Broadway, N. Y. City.

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THE PURIFICATION OF PUBLIC WATER SUPPLIES.—By John W. Hill, M. Am. Soc. C. E. 8vo. Cloth; 304 pages; 35 illustrations. \$3.00.

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